BCN-P5999-1523-C(2308)MEE
NZ2GNS12A2-14DT

'TRANSLATION OF THE ORIGINAL INSTRUCTIONS'

Before Using the Product

Please read this document before use. Keep the document in a safe place for future reference. Make sure that the end users read the document.

SAFETY PRECAUTIONS

(Read these precautions before using this product.)
Before using this product, please read this manual and the relevant manuals carefully and pay full attention to safety to handle the product correctly.
If products are used in a different way from that specified by manufacturers, the protection function of the products may not work properly.
The precautions given in this manual are concerned with this product only. For the safety precautions of the programmable controller system, refer to the MELSEC iQ-R CPU Module User's Manual (Startup).
In this manual, the safety precautions are classified into two levels: "⚠WARNING" and "⚠CAUTION".

⚠WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

⚠AVERTISSEMENT	*Attire l'attention sur le fait qu'une négligence peut créer une situation de danger avec risque de mort ou de blessures graves.*
⚠ATTENTION	*Attire l'attention sur le fait qu'une négligence peut créer une situation de danger avec risque de blessures légères ou de gravité moyennes ou risque de dégâts matériels.*

Under some circumstances, failure to observe the precautions given under "⚠CAUTION" may lead to serious consequences.
Observe the precautions of both levels because they are important for personal and system safety.
Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

[Design Precautions]

⚠WARNING

- When the safety remote I/O module detects an error in an external power supply or a failure in the module, it turns off the outputs. Configure an external circuit to ensure that the power source of a hazard is shut off by turning off the outputs. Failure to do so may result in an accident due to an incorrect output or malfunction.
- When a load current exceeding the rated current or an overcurrent caused by a load short-circuit flows, the safety remote I/O module defines it as a fault and turns off the outputs. Note that if the overcurrent state continues for a long time, it may cause smoke and fire. To prevent this, configure an external safety circuit, such as a fuse.
- At the start-up of the system, if the external power supply is short-circuited by the output wiring of the safety remote I/O module, or if the external power supply is connected with a wrong polarity, a load may turn on just after the power-on. Configure an interlock circuit to ensure that the entire system will always operate safely.
- If a short-circuit occurs between the sink output terminal (Y0-, Y1-) and 24V due to a damage of the cable or connected load, the leakage current of 6.0mA or less may go through a load, flowing to the source output terminal (Y0+, Y1+). To prevent the current from flowing in the opposite direction, connect a load having polarity, or a load that does not operate with a current of 6.0mA or less going through it.
- When a communication failure occurs in the network, the failed station becomes the following status. Check the communication status information and configure an interlock circuit in the program to ensure that the entire system will operate safely. Failure to do so may result in an accident due to an incorrect output or malfunction.
  (1) Remote stations turn off all output from terminals.
  (2) Remote stations suspend safety communications.
- Do not use any "use prohibited" signals as a remote I/O signal since they are used by the system. Do not write any data to the "use prohibited" areas in the remote register. If any of the "use prohibited" signals are used (turned on or off), or any data is written to the "use prohibited" areas, the correct operation of the module cannot be guaranteed. For system areas, "use prohibited" areas, and "use prohibited" signals, refer to "APPENDICES" in the CC-Link IE TSN Waterproof/Dustproof Remote I/O Module (With Safety Functions) User's Manual. For areas used for safety communications, they are protected from being written by users, and thus safety communications failure caused by data writing does not occur.
- When the fast logic interlock is disabled, it is customer's responsibility to build the interlock circuit externally so that the entire system always operates safely. Be sure to connect an interlock mechanism to the output of this I/O module.
- If the measure to prevent the restart cannot be taken, take other measures and ensure that operators are safe and machine parts are not damaged even if a device has restarted with the fast logic interlock disabled.
- To satisfy SIL3, Category 3 PL.e, use input devices with normally closed contacts. Inputs using the devices with normally open contacts do not satisfy SIL3, Category 3 PL.e.

[Design Precautions]

⚠WARNING

- Use a SELV power supply for the devices to be connected to the input part of the safety remote I/O module. If not, SIL3, Category 3 PL.e is not satisfied..

[Design Precautions]

⚠CAUTION

- Do not install the cables connected to external devices or the communication cables together with the main circuit lines or power cables. Keep a distance of 100mm or more between them. Failure to do so may result in malfunction due to electromagnetic interference.
- Select the external devices to be connected to the module by referring to the performance specifications in the CC-Link IE TSN Waterproof/Dustproof Remote I/O Module (With Safety Functions) User's Manual and considering the maximum inrush current. Connecting a device exceeding the maximum inrush current may cause malfunction or failure of the module.

[Security Precautions]

⚠WARNING

- To maintain the security (confidentiality, integrity, and availability) of the programmable controller and the system against unauthorized access, denial-of-service (DoS) attacks, computer viruses, and other cyberattacks from external devices via the network, take appropriate measures such as firewalls, virtual private networks (VPNs), and antivirus solutions.

[Installation Precautions]

⚠WARNING

- Shut off the external power supply (all phases) used in the system before mounting or removing the module. Failure to do so may result in electric shock or cause the module to fail or malfunction.

[Installation Precautions]

⚠CAUTION

- Use the module in an environment that meets the general specifications in the CC-Link IE TSN Waterproof/Dustproof Remote I/O Module (With Safety Functions) User's Manual. Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.
- Do not directly touch any conductive parts and electronic components of the module. Doing so can cause malfunction or failure of the module.
- After the first use of the product, do not connect/remove the connectors more than 50 times (IEC 61131-2/JIS B 3502 compliant). Exceeding the limit may cause malfunction.
- Securely connect the cable connectors. Poor contact may cause malfunction.
- Securely fix the module with the mounting screws. If not, the module will be greatly affected by vibration, causing failure of the module.

[Wiring Precautions]

⚠WARNING

- Shut off the external power supply (all phases) used in the system before wiring. Failure to do so may result in electric shock or cause the module to fail or malfunction.

[Wiring Precautions]

⚠CAUTION

- Individually ground the FG terminal of the programmable controller with a ground resistance of 100 ohms or less. Failure to do so may result in electric shock or malfunction.
- Check the rated voltage and terminal layout before wiring to the module, and connect the cables correctly. Connecting a power supply with a different voltage rating or incorrect wiring may cause fire or failure.
- Prevent foreign matter such as dust or wire chips from entering the module. Such foreign matter can cause a fire, failure, or malfunction.
- Place the cables in a duct or clamp them. If not, dangling cables may swing or inadvertently be pulled, resulting in malfunction or damage to modules or cables. In addition, the weight of the cables may put stress on modules in an environment of strong vibrations and shocks.
- When disconnecting the cable from the module, do not pull the cable by the cable part. For the cable with connector, hold the connector part of the cable. Pulling the cable connected to the module may result in malfunction or damage to the module or cable.
- Do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 100mm or more between them. Failure to do so may result in malfunction due to electromagnetic interference.
- When an overcurrent caused by a failure of an external device or a module flows for a long time, it may cause smoke and fire. To prevent this, configure an external safety circuit, such as a fuse.
- Mitsubishi programmable controllers must be installed in control panels. Wiring and replacement of a module must be performed by qualified maintenance personnel with knowledge of protection against electric shock. For wiring methods, refer to "INSTALLATION AND WIRING" in the CC-Link IE TSN Waterproof/Dustproof Remote I/O Module (With Safety Functions) User's Manual.
- When attaching waterproof caps to the module, tighten the caps within the specified torque range. Undertightening can cause short circuit, fire, or malfunction. Overtightening can damage the cap, resulting in short circuit or malfunction.

[Wiring Precautions]

⚠CAUTION

- The module is compliant with IP67 only when all necessary waterproof connectors and caps have been installed and the cover for the IP address/station number setting switches and the function setting switches has been properly tightened with screws.
- For waterproof cables used for the module, use UL listed cables in the categories "CYJV" and "PVVA", with the suitable voltage, current, and temperature rating (the operating temperature rating of the cables: 75℃ or higher).
- For the safety remote I/O module, prevent foreign matter such as dust or wire chips from attaching to the gasket to keep waterproofing of the cover. Remove the foreign matter if it is attached to the gasket.
- Do not replace or wire the safety remote I/O module immediately after powering off the system because the connector parts of the module can get really hot depending on the load conditions.

[Startup and Maintenance Precautions]

⚠WARNING

- Do not touch any terminal while power is on. Doing so will cause electric shock or malfunction.
- Shut off the external power supply (all phases) used in the system before cleaning the module, retightening screws or connectors, or operating the IP address/station number setting switches. Failure to do so may cause the module to fail or malfunction.

[Startup and Maintenance Precautions]

⚠CAUTION

- Do not disassemble or modify the modules. Doing so may cause failure, malfunction, injury, or a fire.
- Use any radio communication device such as a cellular phone or PHS (Personal Handy-phone System) more than 25cm away from wiring as well as away in all directions from the module. Failure to do so may cause malfunction.
- Shut off the external power supply (all phases) used in the system before mounting or removing the module. Failure to do so may cause the module to fail or malfunction.
- Before handling the module, touch a conducting object such as a grounded metal to discharge the static electricity from the human body. Wearing an anti-static wrist strap (grounded) is also recommended. Not discharging the static electricity may cause the module to fail or malfunction.
- Do not drop or apply strong shock to the module. Doing so may damage the module.
- Shut off the external power supply (all phases) used in the system before installing or removing the module to/from the control panel. Failure to do so may cause the module to fail or malfunction.
- Check the module once a day, by turning on output signals and confirming that no error occurs.
- When loads are connected with double wiring, operate each load separately to check for a failure.
- Startup and maintenance of a control panel must be performed by qualified maintenance personnel with knowledge of protection against electric shock. Lock the control panel so that only qualified maintenance personnel can operate it.

[Disposal Precautions]

⚠CAUTION

- When disposing of this product, treat it as industrial waste.

[Precautions for Using Products]

⚠CAUTION

- Although MELCO has obtained the certification for Product's compliance to the international safety standards IEC 61508 and ISO 13849-1 from TUV Rheinland, this fact does not guarantee that Product will be free from any malfunction or failure.
- With very small probability shown in PFDavg / PFH, the safety remote I/O module has residual risk that input and output may turn on or off in unintended way. When using this product, perform risk assessment on target equipment, and select appropriate SIL and PL, as well as reduce the risk.
- This product complies with following requirements of international safety standards: SIL3 (IEC 61508: 2010), PL.e (EN ISO 13849-1: 2015).

[Transportation Precautions]

⚠CAUTION

- For shipping, always use the original packaging.

[Précautions lors de la conception]

⚠AVERTISSEMENT

- *Quand un module E/S distant de sécurité détecte une erreur dans une alimentation externe, il désactive les sorties. Pour se prémunir contre les risques d'alimentation, créer un circuit externe désactivant les sorties du module E/S distant de sécurité. Une configuration incorrect de ce circuit peut être à l'origine d'un accident par suite des sorties erronées ou de dysfonctionnements.*
- *En cas de circulation d'un courant de charge dépassant la valeur nominale ou d'une surintensité causée par un court-circuit de la charge, le module d'E/S distant de sécurité définit le fait comme un défaut et désactive les sorties. Noter que si l'état de surintensité se prolonge longtemps, il peut causer un dégagement de fumée ou un départ de feu. Pour éviter cela, configurer un circuit de sécurité externe, tel qu'un fusible.*
- *Au démarrage du système, si une alimentation externe est court-circuitée par le câblage de sortie du module d'E/S distant de sécurité, ou si une alimentation externe est connectée avec une mauvaise polarité, une charge peut apparaître juste après la mise sous tension. Configurer un circuit de verrouillage pour garantir que l'ensemble du système fonctionnera toujours en toute sécurité.*
- *Si un court-circuit se produit entre la borne de sortie à dissipateur (Y0-, Y1-) et la borne 24 V suite à l'endommagement du câble ou de la charge connectée, le courant de fuite inférieur ou égal à 6,0 mA peut traverser une charge, jusqu'à s'écouler vers la borne de sortie source (Y0+, Y1+). Pour empêcher le courant de s'écouler dans la direction opposée, connectez une charge polarisée ou bien une charge non traversée par un courant inférieur ou égal à 6,0 mA.*
- *En cas de problème de la communication dans le réseau, la station défaillante devient l'état suivant. Vérifier les informations d'état de communication et configurer un circuit de verrouillage dans le programme pour assurer la sécurité de fonctionnement de l'ensemble du système. Ne pas le faire peut conduire à un accident du fait d'une valeur de sortie incorrecte ou d'un défaut de fonctionnement.*
  (1) Les stations distantes désactivent toutes les sorties en provenant des bornes.
  (2) Les stations distantes suspendent les communications de sécurité.
- *N'utilisez aucun des signaux dont l'usage est interdit ("use prohibited") comme signal d'E/S distant, car ils sont utilisés par le système. N'inscrivez aucune donnée dans les zones dont l'usage est interdit ("use prohibited") dans le registre distant. Si l'un des signaux dont l'usage est interdit est utilisé (activé ou désactivé), ou si des données sont inscrites dans les zones dont l'usage est interdit ("use prohibited"), le fonctionnement correct du module ne peut pas être garanti. Pour en savoir plus sur les zones système, les zones dont l'usage est interdit ("use prohibited") et les signaux dont l'usage est interdit ("use prohibited"), reportez-vous à "ANNEXES" dans le manuel de l'utilisateur du module d'E/S distant CC-Link IE TSN résistant à l'eau/la poussière (avec fonctions de sécurité). Concernant les zones utilisées pour les communications de sécurité, elles sont protégées contre l'écriture par les utilisateurs. Par conséquent, aucune défaillance des communications de sécurité engendrée par l'écriture de données ne se produit.*
- *Lorsque le verrouillage logique rapide est désactivé, il est de la responsabilité du client de constituer le circuit de verrouillage externe afin que l'ensemble du système fonctionne toujours en toute sécurité. S'assurer de connecter un mécanisme de verrouillage à la sortie de ce module E/S.*
- *Si la mesure pour éviter le redémarrage ne peut pas être prise, prendre d'autres mesures et s'assurer que les opérateurs sont en sécurité et que les pièces de la machine ne sont pas endommagées même si un appareil a redémarré avec le verrouillage logique rapide désactivé.*
- *Pour atteindre le niveau SIL3 de catégorie 3 PL.e, utilisez les dispositifs d'entrée avec des contacts normalement fermés. Les entrées utilisant des dispositifs avec des contacts normalement ouverts ne satisfont pas aux critères du niveau SIL3 de catégorie 3 PL.e.*
- *Utilisez une alimentation TBTS pour connecter les appareils à la partie entrée du module E/S de sécurité distant. Dans le cas contraire, le niveau SIL3 de catégorie 3 PL.e ne sera pas atteint.*

[Précautions lors de la conception]

⚠ATTENTION

- *Ne pas installer les câbles connectés aux appareils externes ou les câbles de communication avec les lignes de circuit principal ou les câbles d'alimentation. Garder une distance d'au moins 100 mm entre eux. Ne pas le faire peut causer un défaut de fonctionnement dû à des interférences électromagnétiques.*
- *Sélectionnez les dispositifs externes à connecter au module en vous référant aux spécifications de performances dans le manuel de l'utilisateur du module d'E/S distant CC-Link IE TSN résistant à l'eau/la poussière (avec fonctions de sécurité) et en prenant en compte le courant d'appel maximal. Si vous connectez un dispositif qui dépasse le courant d'appel maximal, le module risque de rencontrer un dysfonctionnement ou une défaillance.*

[Précautions de sécurité]

⚠AVERTISSEMENT

- *Pour maintenir la sécurité (confidentialité, intégrité et disponibilité) de l'automate programmable et du système contre les accès non autorisés, les attaques par déni de service (DoS), les virus informatiques et autres cyberattaques d'appareils externes via le réseau, prendre les mesures appropriées telles que les pare-feux, les réseaux privés virtuels (VPNs), et les solutions antivirus.*

[Précautions d'installation]

⚠AVERTISSEMENT

- *Couper l'alimentation externe du système (sur toutes les phases) avant de mettre en place ou de retirer un module. Faute de quoi, il y a risque d'électrocution et le module risque de tomber en panne ou de mal fonctionner.*

[Précautions d'installation]

⚠ATTENTION

- *Utilisez le module dans un environnement en conformité avec les spécifications générales que présente le manuel de l'utilisateur du module d'E/S distant CC-Link IE TSN résistant à l'eau/la poussière (avec fonctions de sécurité). Le non-respect de cette précaution peut engendrer un choc électrique, un départ de feu, un dysfonctionnement, ou un endommagement ou une détérioration du produit.*
- *Éviter tout contact direct avec les parties conductrices et les composants électroniques du module. Une manipulation incorrecte peut être à l'origine de dysfonctionnements ou de pannes du module.*
- *Après la première mise en service du produit, le nombre maximum admissible d'opérations de connexion/retrait des connecteurs est de 50 (selon CEI 61131-2/JIS B 3502). Dépasser la limite peut provoquer des dysfonctionnements.*
- *Raccorder fermement les connecteurs des câbles. Tout mauvais contact peut être source de dysfonctionnements.*
- *La mise en service et la maintenance des tableaux de commande doivent être effectuées par un personnel de maintenance qualifié et formé à la protection contre les chocs électriques. Les tableaux de commande doivent être fermés à clef pour n'être accessibles qu'à un personnel de maintenance qualifié.*

[Précautions de câblage]

⚠AVERTISSEMENT

- *Avant le câblage, couper l'alimentation externe du système (sur toutes les phases). Faute de quoi, il y a risque d'électrocution et le module risque de tomber en panne ou de mal fonctionner.*

[Précautions de câblage]

⚠ATTENTION

- *Mettre à la terre individuellement la borne FG de l'automate programmable avec une résistance de terre inférieure à 100Ω. Faute de quoi, il y a risque d'électrocution et de dysfonctionnement.*
- *Vérifier la tension nominale et l'affectation des bornes avant le câblage du module et raccorder les câbles correctement. Le raccordement d'une alimentation avec une tension autre que la tension nominale ou une erreur de câblage peuvent causer un départ de feu ou une panne.*
- *Veiller à ne pas laisser la poussière, les copeaux métalliques ou d'autres corps étrangers pénétrer dans le module. De telles corps étrangers peuvent être à l'origine d'un départ de feu, d'une panne ou d'un dysfonctionnement.*
- *Les câbles doivent être placés dans un conduit de câbles ou doivent être attachés. Sinon, les câbles pendants peuvent se balancer ou être tirés par inadvertance, ce qui pourrait causer un mauvais fonctionnement ou endommager les modules ou les câbles. De plus, le poids des câbles peut exercer une contrainte sur les modules dans un environnement de fortes vibrations et chocs.*
- *Pour débrancher le câble du module, ne pas tirer sur le câble lui-même. Pour les câbles avec connecteur, tenir la partie connecteur du câble. Pour le câble raccordé à la plaque à bornes, desserrer la vis de la borne. Tirer sur le câble raccordé au module peut conduire à un défaut de fonctionnement ou endommager le module ou le câble.*
- *Ne pas installer les lignes de commande ou les câbles de communication avec les lignes du circuit principal ou les câbles d'alimentation. Garder une distance d'au moins 100 mm entre eux. Ne pas le faire peut causer un défaut de fonctionnement dû à des interférences électromagnétiques.*
- *Une surintensité causée par une panne d'un appareil externe ou d'un module peut, si elle se prolonge, causer un dégagement de fumée ou un départ de feu. Pour éviter cela, configurer un circuit de sécurité externe, tel qu'un fusible.*
- *Les automates programmables Mitsubishi doivent être installés en tableaux de commande. Le câblage et le remplacement d'un module doivent être effectués par un personnel d'entretien qualifié et formé à la protection contre les risques de choc électrique. Pour plus d'informations sur les méthodes de câblage, reportez-vous à "INSTALLATION ET CÂBLAGE" dans le manuel de l'utilisateur du module d'E/S distant CC-Link IE TSN résistant à l'eau/la poussière (avec fonctions de sécurité).*
- *Lorsque vous installez des capuchons d'étanchéité sur le module, veillez à les serrer conformément au couple de serrage indiqué. Un serrage insuffisant peut engendrer un court-circuit, un départ de feu ou un dysfonctionnement. Un serrage excessif peut endommager le capuchon et engendrer un court-circuit ou un dysfonctionnement.*
- *Le module est conforme à la norme IP67 uniquement lorsque tous les capuchons et connecteurs d'étanchéité nécessaires ont été installés, et lorsque le couvercle des commutateurs de réglage de l'adresse IP/du nombre de stations et des commutateurs de réglage de fonction a été correctement fixé au moyen de vis.*
- *Pour les câbles étanches utilisés pour le module, utilisez les câbles homologués UL dans les catégories "CYJV" et "PVVA" avec la tension, la température et le courant nominaux appropriés (plage de températures de fonctionnement des câbles : 75 ℃ ou plus).*
- *Protégez le module d'E/S distant en empêchant les corps étrangers, tels que de la poussière ou des copeaux métalliques, de se fixer sur le joint afin de garantir l'étanchéité du couvercle. Enlevez tout corps étranger qui se trouverait sur le joint.*
- *Ne pas remplacer ou câbler le module immédiatement après avoir mis le système hors tension car les parties du connecteur du module peuvent devenir très chaudes en fonction des conditions de charge.*

[Précautions de mise en service et de maintenance]

⚠AVERTISSEMENT

- *Ne toucher à aucun des bornes quand le système est sous tension. Faute de quoi, il y a risque d'électrocutions et de dysfonctionnements.*
- *Coupez l'alimentation externe (sur toutes les phases) utilisée dans le système avant le nettoyage du module ou le resserrage des vis ou des connecteurs, ou l'utilisation de contacteur de réglage de l'adresse IP/nombre de stations. Le non-respect de cette précaution peut être à l'origine de pannes ou de dysfonctionnements du module.*

[Précautions de mise en service et de maintenance]

⚠ATTENTION

- *Ne pas démonter ni modifier le module. Cela pourrait entraîner des pannes ou dysfonctionnements et être à l'origine de blessures ou de départs de feu.*
- *Tout type d'appareil de communication radio, comme un téléphone portable ou PHS (Personal handy-phone system), doit être tenu éloigné de plus de 25 cm du câblage ainsi que du module dans tous les sens. Ne pas le faire peut causer un défaut de fonctionnement.*
- *Couper l'alimentation externe du système (sur toutes les phases) avant de mettre en place ou de retirer un module. Le non-respect de cette précaution peut être à l'origine de pannes ou de dysfonctionnements du module.*
- *Avant de manipuler le module, se débarrasser de la charge électrostatique qu'accumule le corps humain en touchant un objet conducteur tel qu'un objet métallique raccordé à la terre. Le port d'un bracelet antistatique (mis à la terre) est également recommandé. Ne pas décharger l'électricité statique peut causer une panne ou un défaut de fonctionnement du module.*
- *Ne pas faire tomber le module et ne pas le soumettre à des chocs. Cela risquerait d'endommager le module.*
- *Avant d'installer ou de retirer le module sur le tableau de commande, couper l'alimentation externe du système (sur toutes les phases). Ne pas le faire peut causer une panne ou un défaut de fonctionnement du module.*
- *Vérifier le module une fois par jour, en activant les signaux de sortie pour vérifier qu'aucune erreur ne survient.*
- *Lorsque des charges sont connectées par un câblage double, faites fonctionner chaque charge séparément pour rechercher d'éventuels signes de défaillance.*
- *La mise en service et la maintenance des tableaux de commande doivent être effectuées par un personnel de maintenance qualifié et formé à la protection contre les chocs électriques. Les tableaux de commande doivent être fermés à clef pour n'être accessibles qu'à un personnel de maintenance qualifié.*

[Précautions de mise au rebut]

⚠ATTENTION

- *Lors de sa mise au rebut, ce produit doit être traité comme un déchet industriel.*

[Précautions pour l'utilisation des produits]

⚠ATTENTION

- *Bien que MELCO ait obtenu la certification que le produit est conforme aux normes de sécurité internationales CEI 61508 et ISO 13849-1 de la part de TUV Rheinland, ceci ne garantit pas que le produit sera exempt de défaut ou de panne.*
- *Avec une très faible probabilité indiquée dans PFDavg/PFH, le module E/S de sécurité distant présente un risque résiduel que l'entrée et la sortie puissent rester malencontreusement activées ou désactivées. Lors de l'utilisation de ce produit, effectuez une évaluation des risques sur l'équipement cible, sélectionnez les SIL et PL appropriés, et veillez aussi à réduire les risques.*
- *Ce produit est conforme aux exigences de sécurité internationales suivantes normes: SIL3 (IEC 61508: 2010), PL.e (EN ISO 13849-1: 2015).*

[Précautions de transport]

⚠ATTENTION

- *Pour l'expedition, toujours utiliser l'emballage d'origine*

CONDITIONS OF USE FOR THE PRODUCT

(1) Although MELCO has obtained the certification for Product's compliance to the international safety standards IEC61508, ISO13849-1 from TUV Rheinland, this fact does not guarantee that Product will be free from any malfunction or failure. The user of this Product shall comply with any and all applicable safety standard, regulation or law and take appropriate safety measures for the system in which the Product is installed or used and shall take the second or third safety measures other than the Product. MELCO is not liable for damages that could have been prevented by compliance with any applicable safety standard, regulation or law.
(2) MELCO prohibits the use of Products with or in any application involving, and MELCO shall not be liable for a default, a liability for defect warranty, a quality assurance, negligence or other tort and a product liability in these applications.
(a) power plants,
(b) trains, railway systems, airplanes, airline operations, other transportation systems,
(c) hospitals, medical care, dialysis and life support facilities or equipment,
(d) amusement equipments,
(e) incineration and fuel devices,
(f) handling of nuclear or hazardous materials or chemicals,
(g) mining and drilling,
(h) and other applications where the level of risk to human life, health or property are elevated.
(3) Mitsubishi Electric shall have no responsibility or liability for any problems involving programmable controller trouble and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

1. Relevant manuals

The following table lists manuals relevant to this product.

Manual name	Manual number
CC-Link IE TSN Waterproof/Dustproof Remote I/O Module (With Safety Functions) User's Manual	SH-082508ENG
MELSEC iQ-R CPU Module User's Manual (Startup)	SH-081263ENG
MELSEC iQ-R CPU Module User's Manual (Application)	SH-081264ENG
MELSEC iQ-R CC-Link IE TSN User's Manual (Startup)	SH-082127ENG
MELSEC iQ-R CC-Link IE TSN User's Manual (Application)	SH-082129ENG

2. Packing list

Check that the following items are included in the package.

Item		Quantity
Module		1
Before Using the Product	Japanese	1
	English	1

3. This product

This product has Hardware Fault Tolerance (HFT) of 1, and complies with following requirements of international safety standards: SIL3 (IEC 61508: 2010), Category 3 PL.e (EN ISO 13849-1: 2015).

4. General Specifications (excerpt)

Item	Specifications
Operating ambient temperature	0 to 55℃
Storage ambient temperature	-25 to 75℃
Operating ambient humidity	Compliant with IP67*1*4
Storage ambient humidity	5 to 95%RH, non-condensing
Operating altitude*2	0 to 2000m
Installation location	Inside a control panel (Indoor use) *3
Overvoltage category	Ⅱ or less
Pollution degree	2 or less

*1 Only when all necessary waterproof connectors and caps have been installed and the indicator cover for the IP address/station number setting switches and the function setting switches has been properly tightened with screws, the module is compliant with IP67. For the tightening torque range of the cover screws for the switches, refer to the following.
□CC-Link IE TSN Waterproof/Dustproof Remote I/O Module (With Safety Functions) User's Manual
*2 Do not use or store the safety remote I/O module under pressure higher than the atmospheric pressure of altitude 0m. Doing so may cause malfunction.
*3 If the environment satisfies the operating ambient temperature, operating ambient humidity, and other conditions, the module can be used even outside the control panel.
*4 IP rating (IP67) is not evaluated as part of UL certified rating.

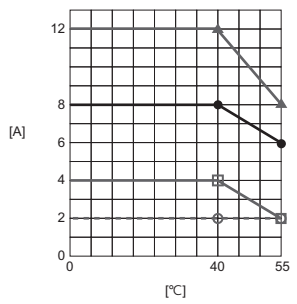
5. Performance specifications (excerpt)

Item	Specifications
Module-and-sensor power supply	24VDC, 260mA*1
Load power supply and external power supply for output part	24VDC, 40mA*1
Rated input voltage, rated input current (X0-XB)	24VDC, 6.8mA*1 TYP. (at 24VDC)
Power supply current for input device (T0-TB)	0.4A/terminal

Item	Specifications
Rated load voltage, maximum load current (Y0+, Y0-, Y1+, Y1-)	24VDC, 4A/point (Y0+, Y0-), 2A/point (Y1+, Y1-)
Communication part (P1, P2)	for CC-Link IE TSN

*1 Current consumption.

Derating chart



▲: Current of the load power supply and external power supply for output part
●: Module-and-sensor power supply current
□: Y0+, Y0-
○: Y1+, Y1-
A: Current
℃: Ambient temperature

6. System configuration

For configuration of CC-Link IE TSN, refer to "SYSTEM CONFIGURATION" in the MELSEC iQ-R CC-Link IE TSN User's Manual (Startup).

7. Wiring

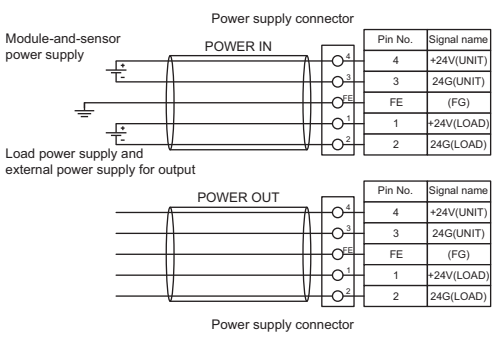
Câblage

7.1 Wiring diagrams

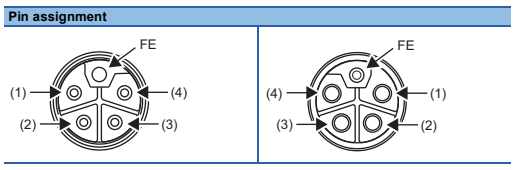
Schémas de câblage

Power supply connector

Câblage des connecteurs de l'alimentation



Pin assignment



Pin number		Signal name	Pin number		Signal name
M12 connector, male (IN)	(1)	+24V (LOAD)	M12 connector, female (OUT)	(1)	+24V (LOAD)
	(2)	24G (LOAD)		(2)	24G (LOAD)
	(3)	24G (UNIT)		(3)	24G (UNIT)
	(4)	+24V (UNIT)		(4)	+24V (UNIT)
	FE	FG		FE	FG

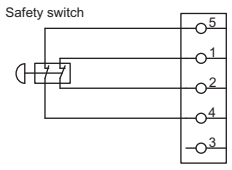
To connect to the module, use the power supply that meets the following condition:
Pour réaliser le raccord au module, utilisez l'alimentation électrique qui répond à la condition suivante :

- SELV (Safety Extra Low Voltage): Product with reinforced insulation from the hazardous potential part (60V or higher)
- *SELV (Très Basse Tension de Sécurité) : Produit avec isolation renforcée de la partie à potentiel dangereux (60 V ou plus)*

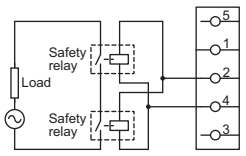
English	*French*
Power supply connector	*Connecteur d'alimentation*
POWER IN	*ENTREE ALIMENTATION*
POWER OUT	*SORTIE ALIMENTATION*
Module-and-sensor power supply	*Alimentation de module-et-capteur*
Load power supply and external power supply for output	*Alimentation électrique de charge et alimentation électrique externe pour la sortie*
Pin No.	*Broche N°*
Signal name	*Nom de signal*
UNIT	*UNITE*
LOAD	*CHARGE*
Pin assignment	*Affectation des broches*
Pin number	*Broche N°*
Signal name	*Nom de signal*
M12 connector, male (IN)	*Connecteur M12 Mâle (IN)*
M12 connector, female (OUT)	*Connecteur M12 Femelle (OUT)*
Safety switch	*Interrupteur de sécurité*
Safety relay	*Relais de sécurité*
Load	*CHARGE*
Safety relay	*Relais de sécurité*
I/O connector	*Connecteurs E/S*
Input connector	*Connecteur d'entrée*
Output connector	*Connecteur de sortie*

I/O connector

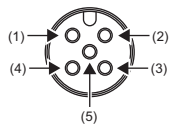
■Input connector



■Output connector



Pin assignment



Pin number		Signal name	Pin number		Signal name
X0	(1)	T1	X8	(1)	T9
X1	(2)	X1	X9	(2)	X9
	(3)	24G (UNIT)		(3)	24G (UNIT)
	(4)	X0		(4)	X8
	(5)	T0		(5)	T8
X2	(1)	T3	XA	(1)	TB
X3	(2)	X3	XB	(2)	XB
	(3)	24G (UNIT)		(3)	24G (UNIT)
	(4)	X2		(4)	XA
	(5)	T2		(5)	TA
X4	(1)	T5	Y0	(1)	Empty
X5	(2)	X5		(2)	Y0-
	(3)	24G (UNIT)		(3)	24G (LOAD)
	(4)	X4		(4)	Y0+
	(5)	T4		(5)	24G (LOAD)
X6	(1)	T7	Y1	(1)	Empty
X7	(2)	X7		(2)	Y1-
	(3)	24G (UNIT)		(3)	24G (LOAD)
	(4)	X6		(4)	Y1+
	(5)	T6		(5)	24G (LOAD)

7.2 Wiring products

Produits pour câblage

Communication cables

Câbles de communication

For recommended waterproof cables for communications, refer to the CC-Link IE TSN Waterproof/Dustproof Remote I/O Module (With Safety Functions) User's Manual.
Afin de consulter la liste des câbles étanches recommandés pour les communications, reportez-vous au manuel de l'utilisateur du module d'E/S distant CC-Link IE TSN résistant à l'eau/la poussière (avec fonctions de sécurité).

Power cables

Câbles d'alimentation

For recommended waterproof power cables, refer to the CC-Link IE TSN Waterproof/Dustproof Remote I/O Module (With Safety Functions) User's Manual.
Pour consulter la liste des câbles d'alimentation étanches recommandés, reportez-vous au manuel de l'utilisateur du module d'E/S distant CC-Link IE TSN résistant à l'eau/la poussière (avec fonctions de sécurité).

I/O cables

Câbles E/S

For recommended waterproof I/O cables, refer to the CC-Link IE TSN Waterproof/Dustproof Remote I/O Module (With Safety Functions) User's Manual.
Pour consulter la liste des câbles d'E/S étanches recommandés, reportez-vous au manuel de l'utilisateur du module d'E/S distant CC-Link IE TSN résistant à l'eau/la poussière (avec fonctions de sécurité).

7.3 Transition wiring of the power supply

When installing multiple safety remote I/O modules, the power can be supplied to the modules through transition wiring. For transition wiring of the power supply, connect cables between the POWER OUT terminal of the module (power supplier) and the POWER IN terminal of another module (power supply destination).
Ensure that the current does not exceed the following current capacity of the power supply connector.

- Module-and-sensor power supply: 8A per pin
- Load power supply and external power supply for output part: 12A per pin

There is current derating. For details, refer to Derating chart in this document.

7.4 Wiring of Ethernet cable

- When using only one of them in star topology, either P1 or P2 can be connected.
- When using both connectors in line topology or ring topology, P1-P1, P2-P2, and P1-P2 connections are possible.

7.5 Setting switches

Setting IP address/station number setting switches

The following figure shows the combinations of x1 and x16.
Set the fourth octet (decimal) of the IP address using the IP address/station number setting switches x1 and x16 (hexadecimal).
The setting range of IP address is 1 to 254.

x1

x16	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
B	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
C	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

8. EMC and Low Voltage Directives

For EMC and Low Voltage Directives, refer to the CC-Link IE TSN Waterproof/Dustproof Remote I/O Module (With Safety Functions) User's Manual.

9. Information and services

For further information and services, please consult your local Mitsubishi representative.l

Machinery Directive (2006/42/EC) Compliance

This product is suitable for establishing safety functions for general industrial machinery and complies with the Machinery Directive (2006/42/EC).
Before using this product, please read this manual, the relevant manuals, and the safety standards carefully and pay full attention to safety to handle the product correctly.

10. Safety Standards

Use the product according to the following safety standards.

Region	Safety standards
International	IEC 61508 (SIL3), IEC 62061 (SIL3), ISO 13849-1 (Category 3 PL.e) IEC 61131-2 IEC 61000-6-2, IEC 61000-6-4 IEC 61784-3 IEC 60204-1
Europe	EN ISO 13849-1 (Category 3 PL.e) EN 61131-2 EN 61000-6-2, EN 61000-6-4
North America	UL 61010-1, UL 61010-2-201

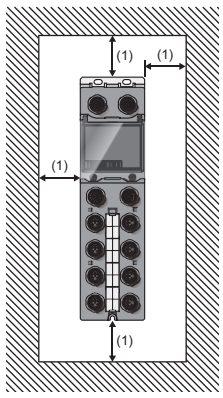
11. Safety Parameters

For details on the safety parameters of this product, refer to "SETTINGS" in the CC-Link IE TSN Waterproof/Dustproof Remote I/O Module (With Safety Functions) User's Manual.

12. Installation

When installing this product to a control panel, fully consider its operability, maintainability, and environmental resistance. For details, refer to "General Specifications", "PROCEDURES BEFORE OPERATION", "INSTALLATION AND WIRING", and "MAINTENANCE AND INSPECTION" in the CC-Link IE TSN Waterproof/Dustproof Remote I/O Module (With Safety Functions) User's Manual.

Installing modules



(1)50mm or more

When installing the safety remote I/O module on a control panel, provide clearance of 50mm or more (1) between the module and the sides of any neighboring structures or parts to ensure good ventilation and allow easy safety remote I/O module replacement.
When installing two or more safety remote I/O modules next to each other, they can be installed in contact with each other.
When using a right-angle or Y-branch type waterproof connector, however, provide enough clearance so that the cable bending radius does not become too short. For the cable bending radius, check the specifications of the cables used.

Installation orientations

The safety remote I/O module can be installed in six directions.
For details, refer to "INSTALLATION AND WIRING" in the CC-Link IE TSN Waterproof/Dustproof Remote I/O Module (With Safety Functions) User's Manual.

Installation precautions

- Install the safety remote I/O module on the flat surface. When the installation surface is uneven, excessive force is applied to the printed-circuit board and may cause a defect.
- Do not install the safety remote I/O module to the place where:
- Ambient temperature is outside the range of 0 to 55℃;
- IP67 is not satisfied;
- Condensation occurs due to rapid temperature change;
- Corrosive gas or combustible gas is present;
- Filled with conductive powder such as dust and iron powder, oil mist, salinity, or organic solvent;
- The safety remote I/O module is exposed to direct sunlight;
- A strong electric field or strong magnetic field is generated (For details, refer to "EMC and Low Voltage Directives" in the CC-Link IE TSN Waterproof/Dustproof Remote I/O Module (With Safety Functions) User's Manual); and
- The safety remote I/O module is subject to vibration and shock (For details, refer to "General Specifications" in the CC-Link IE TSN Waterproof/Dustproof Remote I/O Module (With Safety Functions) User's Manual).
- ⏚ represents a function grounding terminal.

Fixing the safety remote I/O module

When fixing the safety remote I/O module, tighten all of three screws.
If any of the screws is loose, the module will be greatly affected by vibration, causing failure of the module.
When installing the module, tighten screws within the following torque range.

Screw type	Tightening torque range
Screw for an FG metal fitting/mounting bracket (M4 screw)	0.83 to 1.11N·m

13. Module Status after Power-on and LED Indication

No.	Name	Application	
(1)	PW LED	Indicates the status of the power supply. On: Power supply ON Off: Power supply OFF	
(2)	RUN LED	Indicates the operating status. On: Operating normally, in initial processing Flashing: Operating in unit test mode Off: A major error has occurred.	
(3)	SAFETY LED	Indicates the safety communication status of the safety remote I/O module. On: Safety communication established, in initial processing Flashing: Checking the position of the setting target module Off: Safety communication not established	
(4)	ERR. LED	Indicates the error status of the safety remote I/O module. On: A moderate error or major error has occurred, in initial processing Flashing: A minor error has occurred.*2 Off: Operating normally	
(5)	P1 LINK LED	Indicates the link status for P1. On: Link-up Off: Link-down	
(6)	P2 LINK LED	Indicates the link status for P2. On: Link-up Off: Link-down	
(7)	DATA LINK LED	Indicates the data link status of the safety remote I/O module. On: Cyclic transmission being performed, in initial processing Flashing: Cyclic transmission stopped*1 Off: Disconnected	
(8)	X0 LED to XB LED Y0+ LED to Y1- LED	When error points are not indicated	Indicates the ON/OFF status of the inputs. On: Input ON*3 Off: Input OFF
		When error points are indicated	Flashes to indicate the error points. On: Input ON*3 Flashing: An error has occurred.*4 Off: Input OFF
(9)	I/O PW LED	Indicates the status of the power supplied from the external power supply. On: External power supply ON Off: External power supply OFF	

*1 When cyclic transmission is stopped only for the master station, the safety remote I/O module maintains the cyclic transmission. Thus, the DATA LINK LED remains on.
*2 After a minor error has been eliminated, the LED flashes for 5 seconds or longer and turns off.
*3 In the safety drive mode, the LEDs indicate the status of actual input signals that are externally input, regardless of the setting of the input response time setting function.
*4 Flashing indicates that a minor error has occurred in the safety remote I/O module.

14. Precautions for Use of Safety Programmable Controller

Users must prove that their entire safety system complies with the safety standards and the Machinery Directive. The third-party certification organization will validate the safety of product for the entire safety system, including a safety programmable controller and safety components.

Target failure measure (PFDavg/PFH) calculation

To establish a safety system, calculate the target failure measure (PFDavg/PFH) for each safety application (safety function) based on the PFDavg/PFH values of the safety programmable controller and connected safety components. The target failure measure (PFDavg/PFH) is the reliability target value for each Safety Integrity Level (SIL) defined in IEC 61508 and can be calculated by the following formula.
PFDavg/PFH = A + B + C + D.....Calculation formula of PFDavg/PFH

Variable	Definition
A*1	PFDavg/PFH of the safety CPU module
B	PFDavg/PFH of the safety remote I/O module (1) When safety input device(s) and safety output device(s) are connected to the same safety remote I/O module: B = B1 (2) When safety input device(s) and safety output device(s) are connected to the different safety remote I/O modules: B = B1 + B2
B1	PFDavg/PFH of the safety remote I/O module to which safety input device(s) is connected
B2	PFDavg/PFH of the safety remote I/O module to which safety output device(s) is connected
C*1	PFDavg/PFH of safety input device(s)
D*1	PFDavg/PFH of safety output device(s)

*1 For the values of PFDavg/PFH, refer to the manuals for the safety components used.
The following table lists the PFDavg/PFH of safety remote I/O module.

Module	PFDavg	PFH(/h)*2
NZ2GNS12A2-14DT	7.42×10^{-6}	3.19×10^{-9}

*2 Proof test interval is 5 years.

PL evaluation described in ISO 13849-1

For the PL evaluation described in ISO 13849-1, use the $MTTF_D$ (mean time to dangerous failure) and the DCavg (average diagnostic coverage) listed in the following table.

Module		$MTTF_D$	DCavg
Safety remote I/O module	NZ2GNS12A2-14DT	887	96.1

15. EU DECLARATION OF CONFORMITY

MITSUBISHI ELECTRIC
Changes for the Better

ORIGINAL

EU DECLARATION OF CONFORMITY

We,
Manufacturer : MITSUBISHI ELECTRIC CORPORATION
Address (Place of Declare) : TOKYO 100-8310, JAPAN
Brand Name : MITSUBISHI ELECTRIC
declare under our sole responsibility that the product
Description : Programmable Controller
Type name to declare : Remote I/O modules

Type name	Serial No.
NZ2GNS12A2-16DTE	########810#####-#
NZ2GNS12A2-14DT	########811#####-#

(#:0-9, A-F)

to which this declaration relates is in conformity with the following standard and directive.

Directive		Harmonized Standard	Notified Body
EMC Directive	2014/30/EU	EN61131-2:2007	—
Machinery Directive	2006/42/EC	EN ISO 13849-1 : 2015	1
RoHS Directive	2011/65/EU, (EU)2015/863*1	EN IEC63000:2018	—

*1 : Category 9 "Industrial monitoring and control instruments" is applicable.

This declaration is based on the conformity assessment of following Notified Body

No.	Name and Address	Identification Number	Issued certificate No.
1	TÜV RHEINLAND INDUSTRIE SERVICE GMBH, Am Grauen Stein, 51105 Köln, Germany	0035	01/205/5872.00/21 01/205/5844.00/22

Authorized representative in Europe
(The person authorized to compile the Technical file or relevant Technical documentation)
Hartmut Pütz
FA Product Marketing, Director, MITSUBISHI ELECTRIC EUROPE B.V., German Branch
Mitsubishi-Electric-Platz 1, 40882 Ratingen, Germany
Issue Date (Date of Declaration): 31 May. 2022

Signed for and on behalf of
(Signature) Hisafumi Komoto
[Hisafumi Komoto]
Senior Manager, FA Remote I/O Module Development Section
FA Systems Dept.2
MITSUBISHI ELECTRIC CORPORATION NAGOYA WORKS

BCN-P9999-3004-*

16. UK DECLARATION OF CONFORMITY

MITSUBISHI ELECTRIC
Changes for the Better

ORIGINAL

UK DECLARATION OF CONFORMITY

We,
Manufacturer : MITSUBISHI ELECTRIC CORPORATION
Address (Place of Declare) : TOKYO 100-8310, JAPAN
Brand Name : MITSUBISHI ELECTRIC
declare under our sole responsibility that the product
Description : Programmable Controller
Type name to declare : Remote I/O modules

Type name	Serial No.
NZ2GNS12A2-16DTE	########810#####-#
NZ2GNS12A2-14DT	########811#####-#

to which this declaration relates is in conformity with the following standard and legislation.

Legislation	Designated Standard	Approved Body
Electromagnetic Compatibility Regulations 2016	EN 61131-2:2007	—
Supply of Machinery (Safety) Regulations 2008	EN ISO 13849-1:2015	1
The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012	EN IEC 63000:2018	—

This declaration is based on the conformity assessment of following Approved Body

No.	Name and Address	Identification Number	Issued certificate No.
1	TÜV Rheinland UK Ltd., Friars Gate (Third Floor), 1011 Stratford Road, Shirley, Solihull B90 4BN, United Kingdom	2571	01/205U/5872.00/22 01/205U/5884.00/22

Issue Date (Date of Declaration): 2 Nov. 2022

Signed for and on behalf of
(Signature) Hisafumi Komoto
[Hisafumi Komoto]
Senior Manager, FA Remote I/O Module Development Section
FA Systems Dept.2
MITSUBISHI ELECTRIC CORPORATION NAGOYA WORKS

BCN-P9999-3030-B

WARRANTY

Please confirm the following product warranty details before using this product.

1. Limited Warranty and Product Support.

a. Mitsubishi Electric Company ("MELCO") warrants that for a period of eighteen (18) months after date of delivery from the point of manufacture or one year from date of Customer's purchase, whichever is less, Mitsubishi MELSEC Safety programmable logic controllers (the "Products") will be free from defects in material and workmanship.
b. At MELCO's option, for those Products MELCO determines are not as warranted, MELCO shall either repair or replace them or issue a credit or return the purchase price paid for them.
c. For this warranty to apply:
(1) Customer shall give MELCO (i) notice of a warranty claim to MELCO and the authorized dealer or distributor from whom the Products were purchased, (ii) the notice shall describe in reasonable details the warranty problem, (iii) the notice shall be provided promptly and in no event later than thirty (30) days after the Customer knows or has reason to believe that Products are not as warranted, and (iv) in any event, the notice must given within the warranty period;
(2) Customer shall cooperate with MELCO and MELCO's representatives in MELCO's investigation of the warranty claim, including preserving evidence of the claim and its causes, meaningfully responding to MELCO's questions and investigation of the problem, grant MELCO access to witnesses, personnel, documents, physical evidence and records concerning the warranty problem, and allow MELCO to examine and test the Products in question offsite or at the premises where they are installed or used; and
(3) If MELCO requests, Customer shall remove Products it claims are defective and ship them to MELCO or MELCO's authorized representative for examination and, if found defective, for repair or replacement. The costs of removal, shipment to and from MELCO's designated examination point, and reinstallation of repaired or replaced Products shall be at Customer's expense.
(4) If Customer requests and MELCO agrees to effect repairs onsite at any domestic or overseas location, the Customer will pay for the costs of sending repair personnel and shipping parts. MELCO is not responsible for any re-commissioning, maintenance, or testing on-site that involves repairs or replacing of the Products.
d. Repairs of Products located outside of Japan are accepted by MELCO's local authorized service facility centers ("FA Centers"). Terms and conditions on which each FA Center offers repair services for Products that are out of warranty or not covered by MELCO's limited warranty may vary.
e. Subject to availability of spare parts, MELCO will offer Product repair services for (7) years after each Product model or line is discontinued, at MELCO's or its FA Centers' rates and charges and standard terms in effect at the time of repair. MELCO usually produces and retains sufficient spare parts for repairs of its Products for a period of seven (7) years after production is discontinued.
f. MELCO generally announces discontinuation of Products through MELCO's Technical Bulletins. Products discontinued and repair parts for them may not be available after their production is discontinued.

2. Limits of Warranties.

a. MELCO does not warrant or guarantee the design, specify, manufacture, construction or installation of the materials, construction criteria, functionality, use, properties or other characteristics of the equipment, systems, or production lines into which the Products may be incorporated, including any safety, fail-safe and shut down systems using the Products.
b. MELCO is not responsible for determining the suitability of the Products for their intended purpose and use, including determining if the Products provide appropriate safety margins and redundancies for the applications, equipment or systems into which they are incorporated.
c. Customer acknowledges that qualified and experienced personnel are required to determine the suitability, application, design, construction and proper installation and integration of the Products. MELCO does not supply such personnel.
d. MELCO is not responsible for designing and conducting tests to determine that the Product functions appropriately and meets application standards and requirements as installed or incorporated into the end-user's equipment, production lines or systems.
e. MELCO does not warrant any Product:
(1) repaired or altered by persons other than MELCO or its authorized engineers or FA Centers;
(2) subjected to negligence, carelessness, accident, misuse, or damage;
(3) improperly stored, handled, installed or maintained;
(4) integrated or used in connection with improperly designed, incompatible or defective hardware or software;
(5) that fails because consumable parts such as batteries, backlights, or fuses were not tested, serviced or replaced;
(6) operated or used with equipment, production lines or systems that do not meet applicable and commensurate legal, safety and industry-accepted standards;
(7) operated or used in abnormal applications;
(8) installed, operated or used in contravention of instructions, precautions or warnings contained in MELCO's user, instruction and/or safety manuals, technical bulletins and guidelines for the Products;
(9) used with obsolete technologies or technologies not fully tested and widely accepted and in use at the time of the Product's manufacture;
(10) subjected to excessive heat or moisture, abnormal voltages, shock, excessive vibration, physical damage or other improper environment; or
(11) damaged or malfunctioning due to Acts of God, fires, acts of vandals, criminals or terrorists, communication or power failures, or any other cause or failure that results from circumstances beyond MELCO's control.
f. All Product information and specifications contained on MELCO's website and in catalogs, manuals, or technical information materials provided by MELCO are subject to change without prior notice.
g. The Product information and statements contained on MELCO's website and in catalogs, manuals, technical bulletins or other materials provided by MELCO are provided as a guide for Customer's use. They do not constitute warranties and are not incorporated in the contract of sale for the Products.
h. These terms and conditions constitute the entire agreement between Customer and MELCO with respect to warranties, remedies and damages and supersede any other understandings, whether written or oral, between the parties. Customer expressly acknowledges that any representations or statements made by MELCO or others concerning the Products outside these terms are not part of the basis of the bargain between the parties and are not factored into the pricing of the Products.
i. THE WARRANTIES AND REMEDIES SET FORTH IN THESE TERMS ARE THE EXCLUSIVE AND ONLY WARRANTIES AND REMEDIES THAT APPLY TO THE PRODUCTS.
j. MELCO DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

3. Limits on Damages.

a. MELCO'S MAXIMUM CUMULATIVE LIABILITY BASED ON ANY CLAIMS FOR BREACH OF WARRANTY OR CONTRACT, NEGLIGENCE, STRICT TORT LIABILITY OR OTHER THEORIES OF RECOVERY REGARDING THE SALE, REPAIR, REPLACEMENT, DELIVERY, PERFORMANCE, CONDITION, SUITABILITY, COMPLIANCE, OR OTHER ASPECTS OF THE PRODUCTS OR THEIR SALE, INSTALLATION OR USE SHALL BE LIMITED TO THE PRICE PAID FOR PRODUCTS NOT AS WARRANTED.
b. Although MELCO has obtained the certification for Product's compliance to the international safety standards IEC61508 and EN954-1/ISO13849-1 from TUV Rheinland, this fact does not guarantee that Product will be free from any malfunction or failure. The user of this Product shall comply with any and all applicable safety standard, regulation or law and take appropriate safety measures for the system in which the Product is installed or used and shall take the second or third safety measures other than the Product. MELCO is not liable for damages that could have been prevented by compliance with any applicable safety standard, regulation or law.
c. MELCO prohibits the use of Products with or in any application involving power plants, trains, railway systems, airplanes, airline operations, other transportation systems, amusement equipments, hospitals, medical care, dialysis and life support facilities or equipment, incineration and fuel devices, handling of nuclear or hazardous materials or chemicals, mining and drilling, and other applications where the level of risk to human life, health or property are elevated.
d. MELCO SHALL NOT BE LIABLE FOR SPECIAL, INCIDENTAL, CONSEQUENTIAL, INDIRECT OR PUNITIVE DAMAGES, FOR LOSS OF PROFITS, SALES, OR REVENUE, FOR INCREASED LABOR OR OVERHEAD COSTS, FOR DOWNTIME OR LOSS OF PRODUCTION, FOR COST OVERRUNS, OR FOR ENVIRONMENTAL OR POLLUTION DAMAGES OR CLEAN-UP COSTS, WHETHER THE LOSS IS BASED ON CLAIMS FOR BREACH OF CONTRACT OR WARRANTY, VIOLATION OF STATUTE, NEGLIGENCE OR OTHER TORT, STRICT LIABILITY OR OTHERWISE.
e. In the event that any damages which are asserted against MELCO arising out of or relating to the Products or defects in them, consist of personal injury, wrongful death and/or physical property damages as well as damages of a pecuniary nature, the disclaimers and limitations contained in these terms shall apply to all three types of damages to the fullest extent permitted by law. If, however, the personal injury, wrongful death and/or physical property damages cannot be disclaimed or limited by law or public policy to the extent provided by these terms, then in any such event the disclaimer of and limitations on pecuniary or economic consequential and incidental damages shall nevertheless be enforceable to the fullest extent allowed by law.
f. In no event shall any cause of action arising out of breach of warranty or otherwise concerning the Products be brought by Customer more than one year after the cause of action accrues.
g. Each of the limitations on remedies and damages set forth in these terms is separate and independently enforceable, notwithstanding the unenforceability or failure of essential purpose of any warranty, undertaking, damage limitation, other provision of these terms or other terms comprising the contract of sale between Customer and MELCO.

4. Delivery/Force Majeure.

a. Any delivery date for the Products acknowledged by MELCO is an estimated and not a promised date. MELCO will make all reasonable efforts to meet the delivery schedule set forth in Customer's order or the purchase contract but shall not be liable for failure to do so.
b. Products stored at the request of Customer or because Customer refuses or delays shipment shall be at the risk and expense of Customer.
c. MELCO shall not be liable for any damage to or loss of the Products or any delay in or failure to deliver, service, repair or replace the Products arising from shortage of raw materials, failure of suppliers to make timely delivery, labor difficulties of any kind, earthquake, fire, windstorm, flood, theft, criminal or terrorist acts, war, embargoes, governmental acts or rulings, loss or damage or delays in carriage, acts of God, vandals or any other circumstances reasonably beyond MELCO's control.

5. Choice of Law/Jurisdiction.

These terms and any agreement or contract between Customer and MELCO shall be governed by the laws of the State of New York without regard to conflicts of laws. To the extent any action or dispute is not arbitrated, the parties consent to the exclusive jurisdiction and venue of the federal and state courts located in the Southern District of the State of New York. Any judgment there obtained may be enforced in any court of competent jurisdiction.

6. Arbitration.

Any controversy or claim arising out of, or relating to or in connection with the Products, their sale or use or these terms, shall be settled by arbitration conducted in accordance with the Center for Public Resources (CPR) Rules for Non-Administered Arbitration of International Disputes, by a sole arbitrator chosen from the CPR's panels of distinguished neutrals. Judgment upon the award rendered by the Arbitrator shall be final and binding and may be entered by any court having jurisdiction thereof. The place of the arbitration shall be New York City, New York. The language of the arbitration shall be English. The neutral organization designated to perform the functions specified in Rule 6 and Rules 7.7(b), 7.8 and 7.9 shall be the CPR.

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