

MITSUBISHI

Peripheral Connection Module

User's Manual (Hardware)

AJ65BT-G4-S3

Thank you for buying the Mitsubishi general-purpose programmable logic controller MELSEC-A Series

Prior to use, please read both this manual and detailed manual thoroughly and familiarize yourself with the product.



MODEL	AJ65BTG4S3-U-HW
MODEL CODE	13JT07
IB(NA)-0800137-B(0607)MEE	

● SAFETY PRECAUTIONS ●

(Always read these instructions before using this equipment.)


Before using this product, please read this manual and the relevant manuals introduced in this manual carefully and pay full attention to safety to handle the product correctly. The instructions given in this manual are concerned with this product. For the safety instructions of the programmable controller system, please read the CPU module user's manual. In this manual, the safety instructions are ranked as "DANGER" and "CAUTION".

DANGER

Procedures which may lead to a dangerous condition and cause death or serious injury, if not carried out properly.

CAUTION

Procedures which may lead to a dangerous condition and cause superficial to medium injury, or physical damage only, if not carried out properly.

Note that the  CAUTION level may lead to a serious consequence according to the circumstances.

Always follow the instructions of both levels because they are important to personal safety.

Please save this manual to make it accessible when required and always forward it to the end user.

[DESIGN PRECAUTIONS]

DANGER

- When using the peripheral for the online operation of the running PLC (e.g. data change, forced output, program change or operating status change (remote RUN/STOP etc.)), establish an interlock circuit outside the PLC system so that the whole system always operates on the safe side. Also, the user should determine corrective and other actions to be taken when a data communication error occurs between the peripheral and PLC.

CAUTION

- Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other. They should be installed 100 mm (3.94 inch) or more from each other. Not doing so could result in noise that would cause malfunction.

[INSTALLATION PRECAUTIONS]

CAUTION

- Use the PLC in an environment that meets the general specifications contained in the CPU user's manual to use. Using this module in an environment outside the range of the general specifications could result in fire, malfunction, and damage to or deterioration of the product.
- Securely fix the module using the DIN rail or mounting screws and fully tighten the mounting screws within the specified torque range. If the screws are loose, it may result in fallout, short circuits, or malfunctions. Tightening the screw too far may cause damages to the screws and/or the module, resulting in a fallout, short circuits, or malfunctions.
- Do not directly touch the module's conductive parts or electronic components. Doing so could cause malfunction or failure in the module.

[WIRING PRECAUTIONS]

DANGER

- Before starting installation or wiring work, be sure to shut off all phases of external power supply used by the system. Not doing so could result in electric shock or damage to the product.
- When switching power on or starting operation after mounting, wiring, operation check or other work, always close the terminal cover. Not doing so can cause a short circuit or misoperation due to module damage or cable connection fault.

CAUTION

- Before wiring the module, confirm the rated voltage and terminal arrangement of the product. A fire or failure can occur if the power supply connected is different from the rating or wiring is incorrect.
- Tighten the terminal screws within the range of the specified torque. If the terminal screws are loose, it may result in short circuits, or malfunctions. Tightening the terminal screws too far may cause damages to the terminal screws and/or the module, resulting in short circuits, or malfunctions.
- Be sure there are no foreign substances such as sawdust or wiring debris inside the module. Such debris could cause fires, failure, or malfunction.
- Be sure to earth the FG terminal to the protective earth conductor. Not doing so may cause misoperation.

[WIRING PRECAUTIONS]

CAUTION

- Do not install the control lines together with the communication cables, or bring them close to each other. Failure to do so may cause malfunctions due to noise.
- The communication cables and power supply cable connected to the module must be placed in a conduit or fixed with a clamp. Not doing so can damage the module or cables due to dangling, moved or accidentally pulled cables or can cause misoperation due to cable contact failure.
- Do not grab on the cable when removing the communication or power cable connected to the module. When removing the cable with a connector, hold the connector on the side that is connected to the module. When disconnecting a cable without a connector, first loosen the screws on the part that is connected to the module. Pulling the cable when it is still connected to the module may cause damage to the module or cable, or misoperation due to cable contact failure.
- Before connecting the cables, check the type of interface to be connected. Do not connect the cables to the equipment of different interface specifications. It can cause the module to fail.
- Perform correct pressure-displacement, crimp-contact or soldering for wire connections using the tools specified by the manufactures. Attach connectors to the module securely. Doing so could cause malfunction or failure in the module.

REVISIONS

* The manual number is given on the bottom right of the front cover.

Print Date	* Manual Number	Revision
Sep., 2000	IB (NA)-0800137-A	First edition
Jul., 2006	IB (NA)-0800137-B	<div style="border: 1px solid black; display: inline-block; padding: 2px;">Partial Correction</div> SAFETY PRECAUTIONS, Conformation to the EMC Directive and Low Voltage Instruction, Chapter 1, Section 2.1, 2.2, 3.1, Chapter 4, 5

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About the Manuals

The following product manuals are available.

Please use this table as a reference to request the appropriate manual as necessary.

Detailed manual

Manual Name	Manual Number (Model Code)
Type AJ65BT-G4-S3 Peripheral Connection Module User's Manual	SH-080105 (13JR17)

Conformation to the EMC Directive and Low Voltage Instruction

When incorporating the Mitsubishi PLC into other machinery or equipment and keeping compliance with the EMC and low voltage directives, refer to Chapter 3, "EMC Directives and Low Voltage Directives" of the User's Manual (Hardware) included with the CPU module or base unit used.

The CE logo is printed on the rating plate of the PLC, indicating compliance with the EMC and low voltage directives.

To conform this product to the EMC Directive and Low Voltage Directive, refer to the Section of "CC-Link Modules" in Chapter 3 "EMC Directive and Low Voltage Directive" in the User's Manual (Hardware) of the CPU module used or the PLC CPU supplied with the base unit.

1. OVERVIEW

This manual provides the specifications, handling instructions and other information of Type AJ65BT-G4-S3 peripheral connection module (hereafter abbreviated to the G4-S3) used in a CC-Link system.

After unpacking the module, confirm that any of the following products is enclosed.

Model name	Product name	Quantity
AJ65BT-G4-S3	Peripheral connection module type AJ65BT-G4-S3	1

2. SPECIFICATIONS

The following table lists the specifications of the G4-S3.

2.1 General Specifications

Item	Specifications					
Operating ambient temperature	0 to 50 °C					
Operating ambient temperature	-20 to 75 °C					
Operating ambient temperature	10 to 90 % RH, No condensation					
Storage ambient humidity	10 to 90 % RH, No condensation					
Vibration resistance	Conforming to JIS B 3502, IEC 61131-2	—	Frequency	Acceleration	Amplitude	Sweep Count 10 times each in X, Y and Z axis (80 minutes)
		When there is intermittent vibration	10 to 57Hz	—	0.075mm (0.003in.)	
			57 to 150Hz	9.8m/s ²	—	
		When there is continuous vibration	10 to 57Hz	—	0.35mm (0.014in.)	
57 to 150Hz	4.9m/s ²		—			
Shock resistance	Conforming to JIS B 3502, IEC 61131-2 (147 m/s ² , 3 times each in 3 directions)					
Operating environment *3	No corrosive gas present					
Operating height	2000m (6562ft.) max.					
Installation area	Control panel					
Over-voltage category *1	II max.					
Pollution rate *2	2 max.					

*1: Indicates the distribution area where the device is assumed to be connected, from the public power distribution network to the local machine device. Category II is applied to the devices to which the power is supplied from a fixed equipment.

The surge resistance voltage of a rated 300 V device is 2500 V.

- *2: This is an index which indicates the occurrence rate of the conductive object in the environment where the device is used. Pollution rate II indicates that only non-conductive pollution may occur with a possibility of generating temporary conductivity due to accidental condensation.
- *3: Do not use or store the PLC in the environment where the pressure is higher than the atmospheric pressure at sea level. Otherwise, malfunction may result. To use the PLC in high-pressure environment, contact your nearest Mitsubishi representative.

2.2 Performance Specifications

Item	Specifications
RS-422 interface	For connection of peripheral, 1 channel
CC-Link station type	Intelligent device station
Number of stations occupied	1 station: RX/RY 32 points each RWr/RWw 4 points each
Permissible instantaneous power failure time	1ms
Transmission speed/max. transmission distance	(Refer to Control & Communication Link System Master/Local Module User's Manual.)
Connection cable (for CC-Link)	
Max. number of modules connected	Up to 26
Terminal block	7-pin terminal block (M3.5 × 7screws)
Applicable cable size	0.75 to 2.00mm ²
Applicable crimping terminal	RAV1.25-3, RAV2-3.5 (conforming to JIS C 2805)
Module mounting screws	Screws of M4 × 0.7mm × 16mm or larger DIN rail may also be used for mounting.
Applicable DIN rails	TH35-7.5Fe, TH35-7.5Al, TH35-15Fe (conforming to JIS C 2812)
24VDC internal current consumption	0.19A
Power supply (for module drive)	24VDC (15.6 to 28.8V)
Noise immunity	Measure using a noise simulator of noise voltage 500Vp-p, noise width 1μs and noise frequency 25 to 60Hz.
Insulation resistance	10MΩ or more across all DC external terminals and grounding terminal using a 500VDC insulation resistance tester.
Withstanding voltage	500VAC for 1 minute across all DC external terminals and grounding terminal
Weight	0.36kg
Outline dimensions	80mm (3.15inch) × 170mm (6.70inch) × 63.5mm (2.50inch)

3. LOADING AND INSTALLATION

3.1 Handling Instructions

This section gives the handling instructions of the G4-S3.

POINT
For handling instructions such as module installation/removal, read ●SAFETY PRECAUTIONS● given at the beginning of this manual.

(1) Tighten the terminal screws and mounting screws of the module within the following ranges.

Screw Location	Tightening Torque Range
Module mounting screw (M4 screw)	0.78 to 1.18N•m
Terminal block terminal screw (M3.5 screw)	0.59 to 0.88N•m
Terminal block mounting screw (M4 screw)	0.78 to 1.18N•m
RS-422 connector mounting screw (M2.6 screw)	0.19 to 0.24N•cm

(2) When using the DIN rail adapter, note the following in mounting the DIN rail.

(a) Applicable DIN rail type (conforming to JIS C 2812)

TH35-7.5Fe, TH35-7.5Al, TH35-15Fe

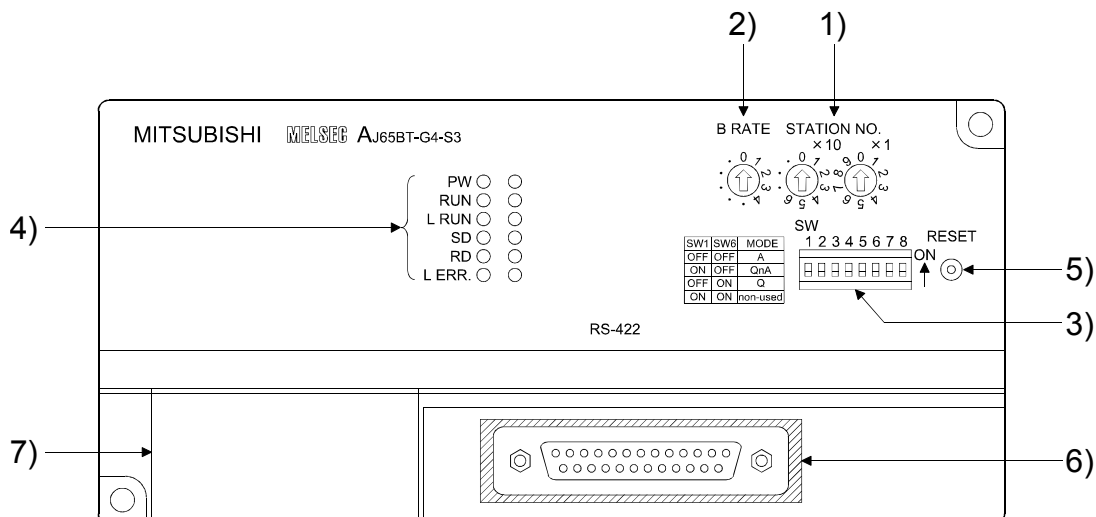
(b) DIN rail mounting screw pitch

When mounting the DIN rail, tighten screws in 200mm(7.88inch) or less pitch.

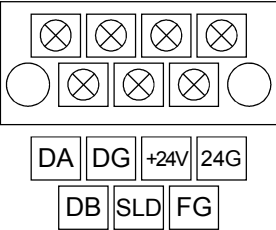
3.2 Installation Environment

Refer to the user's manual of the CPU module used.

4. NAMES OF THE PARTS AND THEIR SETTINGS



No.	Name	Description																																																										
1)	Station number setting switches 	Set the station number of the G4-S3 within the range 1 to 63 or 1 to 64. (If the station number you set is other than 1 to 64, the L ERR. LED is ON.) Use "x10" to set the tens. Use "x1" to set the modules. (Factory setting) *1																																																										
2)	Data link transmission speed setting switch 	Used to set the transmission speed of the G4-S3. (For data link) <table border="1"> <thead> <tr> <th>No. to Be Set</th> <th>Transmission Speed</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>156kbps</td> </tr> <tr> <td>1</td> <td>625kbps</td> </tr> <tr> <td>2</td> <td>2.5Mbps</td> </tr> <tr> <td>3</td> <td>5Mbps</td> </tr> <tr> <td>4</td> <td>10Mbps</td> </tr> <tr> <td>Other than 0 to 4</td> <td>Unused (If the value you set is other than 0 to 4, the L ERR. LED is ON to indicate a communication error.)</td> </tr> </tbody> </table> <p style="text-align: right;">(Factory setting: 0 (156kbps))</p>	No. to Be Set	Transmission Speed	0	156kbps	1	625kbps	2	2.5Mbps	3	5Mbps	4	10Mbps	Other than 0 to 4	Unused (If the value you set is other than 0 to 4, the L ERR. LED is ON to indicate a communication error.)																																												
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3)	Operation setting DIP switches 	Used to set the operational specifications of the G4-S3. <table border="1"> <thead> <tr> <th rowspan="2">SW No.</th> <th rowspan="2">Setting Item</th> <th colspan="2">Setting Switch Position</th> <th rowspan="2">Description</th> </tr> <tr> <th>ON</th> <th>OFF</th> </tr> </thead> <tbody> <tr> <td rowspan="4">1,6</td> <td rowspan="4">Operation mode</td> <td>SW1</td> <td>SW6</td> <td>Operation mode</td> <td rowspan="5">When using GX Developer Version 6 or later, set to the Q mode. When using any other software package, make setting according to the accessed PLC CPU. Can be changed during operation.</td> </tr> <tr> <td>OFF</td> <td>OFF</td> <td>A mode</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>QnA mode</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>Q mode</td> </tr> <tr> <td>ON</td> <td>ON</td> <td>Must not be set.</td> </tr> <tr> <td rowspan="4">2,3</td> <td rowspan="4">Peripheral transmission speed (bps)</td> <td>SW2</td> <td>SW3</td> <td>Transmission Speed</td> <td rowspan="5">When setting the operation mode of the G4-S3 to the QnA mode, make setting according to the peripheral. (Valid for only the QnA mode.) Invalid for the A and Q modes. Must not be changed during operation.</td> </tr> <tr> <td>OFF</td> <td>OFF</td> <td>9600bps</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>19200bps</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>38400bps</td> </tr> <tr> <td>ON</td> <td>ON</td> <td>Must not be set.</td> </tr> <tr> <td>4,5</td> <td>Parity bit yes/no</td> <td colspan="2">Fixed to OFF</td> <td>_____</td> </tr> <tr> <td>7</td> <td>Not used</td> <td colspan="2">Fixed to OFF</td> <td>_____</td> </tr> <tr> <td>8</td> <td>Test mode</td> <td>Test mode</td> <td>Online mode</td> <td>Set this switch to ON when making hardware test.</td> </tr> </tbody> </table> <p style="text-align: right;">(Factory setting: All switches in OFF position)</p>	SW No.	Setting Item	Setting Switch Position		Description	ON	OFF	1,6	Operation mode	SW1	SW6	Operation mode	When using GX Developer Version 6 or later, set to the Q mode. When using any other software package, make setting according to the accessed PLC CPU. Can be changed during operation.	OFF	OFF	A mode	ON	OFF	QnA mode	OFF	ON	Q mode	ON	ON	Must not be set.	2,3	Peripheral transmission speed (bps)	SW2	SW3	Transmission Speed	When setting the operation mode of the G4-S3 to the QnA mode, make setting according to the peripheral. (Valid for only the QnA mode.) Invalid for the A and Q modes. Must not be changed during operation.	OFF	OFF	9600bps	ON	OFF	19200bps	OFF	ON	38400bps	ON	ON	Must not be set.	4,5	Parity bit yes/no	Fixed to OFF		_____	7	Not used	Fixed to OFF		_____	8	Test mode	Test mode	Online mode	Set this switch to ON when making hardware test.
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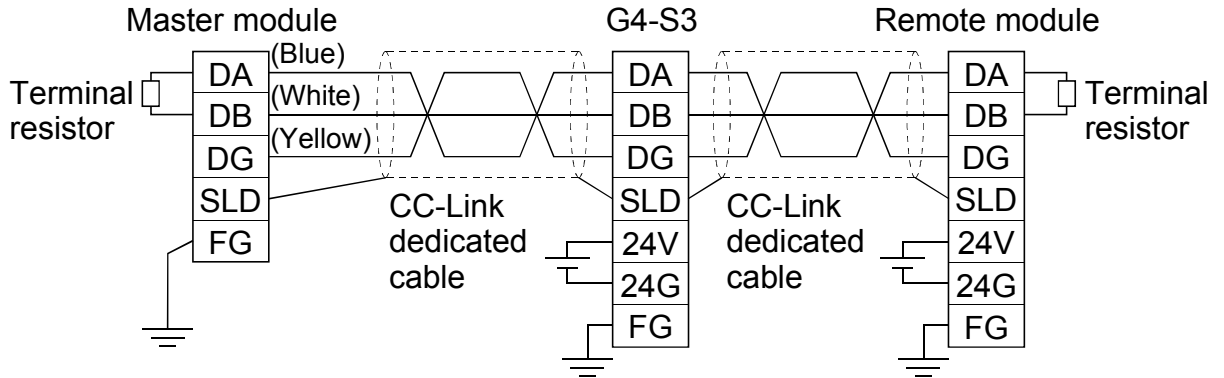
No.	Name	Description
4)	Indicator LEDs PW ○ RUN ○ L RUN ○ SD ○ RD ○ L ERR.○	PW ON : Power on. OFF : Power off.
		RUN ON : Normal operation. OFF : 24VDC power OFF or Watchdog timer error.
		L RUN ON : Normal communication. OFF : Communication fault. (time excess error.)
		SD ON to indicate data transmission.
		RD ON to indicate data receive.
		L ERR. ON : Indicates that a communication data error (CRC error) occurred or that the station number setting or data link transmission speed setting switch is set to outside the range. Flicker at regular intervals: Indicates that the station number setting or data link transmission speed setting switch position was changed while power is on. Flicker at irregular intervals: Indicates that the terminal resistor is left unconnected or that the module or CC-Link dedicated cable is affected by noise. OFF : Normal communication
5)	Reset switch RESET ○	Hardware reset. Used to reset to the power-on status.
6)	RS-422 interface *2	Interface for connecting the peripheral device. The cable as used to connect the peripheral and QnACPU/ACPU may be used as the connection cable. Refer to the MELSEC PLC programming software operating manual.
7)	Power supply and data link terminal block	Terminal block for power supply and data link. For the wiring method, refer to Chapter 5. 

*1: Refer to the user's manual for the setting of the G4-S3's station number.

*2: Do not connect the RS-232 equipment to the RS-422 interface.
Doing so will damage the RS-422 interface hardware of the G4-S3, disabling communication.

5. EXTERNAL WIRING

This chapter shows how to wire the CC-Link dedicated cables between the master and remote modules and how to wire the power supplies.



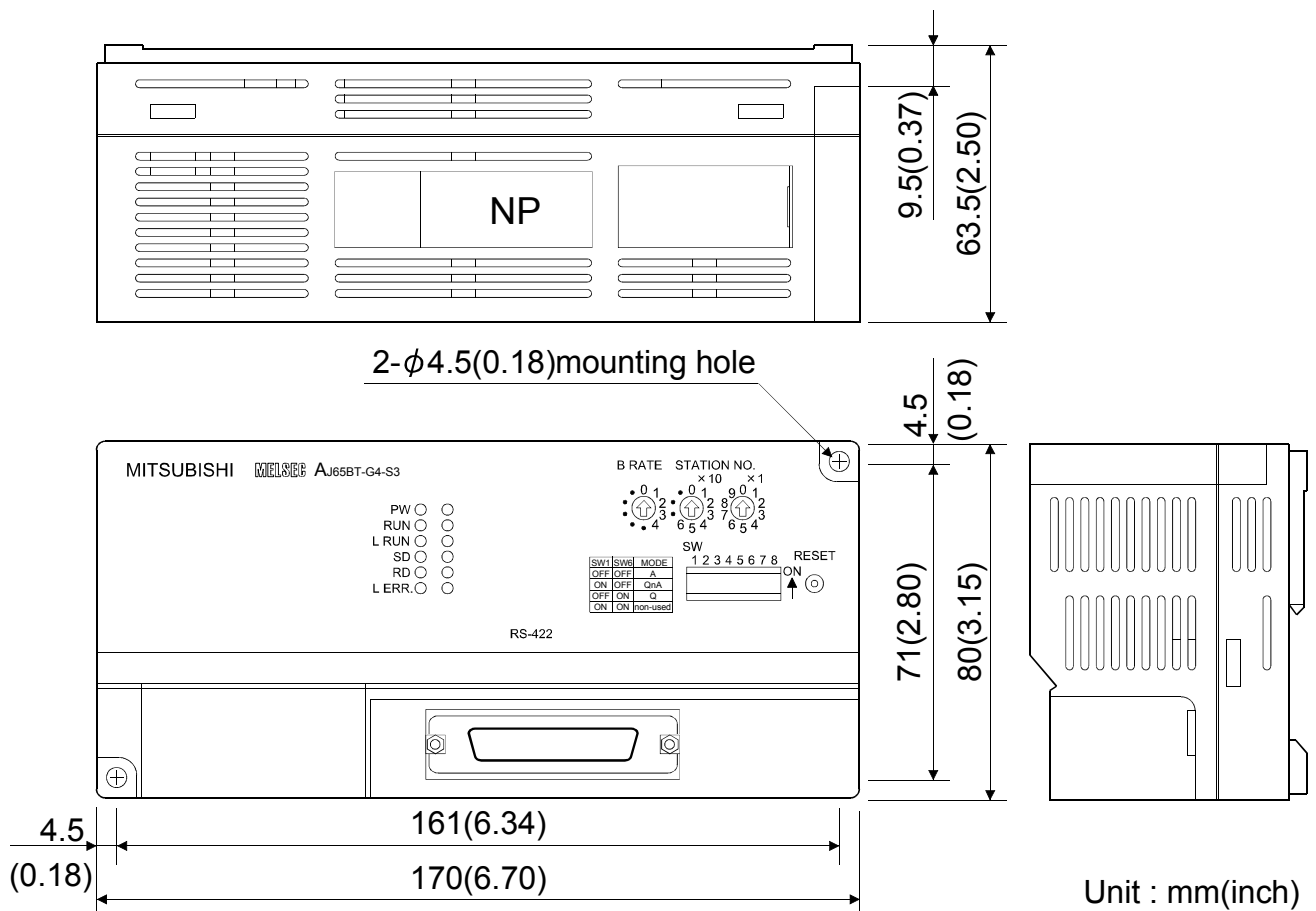
POINT

"Terminal resistors" must be connected to the sections between DA and DB of the modules at the both ends of the CC-Link.

When connecting the terminal resistor to the G4-S3, use the terminal resistor supplied with the Master module.

(Refer to the Control & Communication Link System Master/Local Module User's Manual.)

6. OUTLINE DIMENSION DRAWING



Warranty

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; machine damage or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

For safe use

- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi.
- This product has been manufactured under strict quality control. However, when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

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