

# MITSUBISHI

## Q62AD-DGH Channel Isolated High Resolution Analog-Digital Converter Module (with Signal Conditioning Function)

Thank you for buying the Mitsubishi programmable logic controller MELSEC Q Series.

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

### User's Manual (Hardware)

MELSEC-Q

Mitsubishi Programmable Logic Controller

MODEL	Q-A/D-DGH-U-HW
MODEL Code	13JT83

IB-0800224-A (0204) MEE

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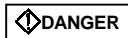
## SAFETY PRECAUTIONS

(Read these precautions before using.)

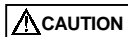
When using Mitsubishi equipment, thoroughly read this manual and the related manuals introduced in the manual. Also pay careful attention to safety and handle the module correctly.

These precautions apply only to this product. Refer to the user's manual of the CPU module to use for the PLC system safety precautions.

These SAFETY PRECAUTIONS classify the safety precautions into two categories: "DANGER" and "CAUTION".



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



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

Depending on circumstances, procedures indicated by CAUTION may also cause to serious accidents.

In any case, it is important to follow the directions for usage.

Store this manual in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.

### DESIGN PRECAUTIONS

#### 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. Otherwise, noise may occur and result in malfunction.

### INSTALLATION PRECAUTIONS

#### CAUTION

- Use the PLC in an environment that meets the general specifications given in the User's Manual of the CPU module being used. Using this PLC in an environment outside the range of the general specifications may cause electric shock, fire, malfunction, and damage to or deterioration of the product.
- When installing the module, securely insert the module fixing tabs into the mounting holes of the base unit while pressing the installation lever located at the bottom of the module downward. Incorrect installation may result in malfunction or breakdown, or cause the module to loosen and drop. Securely fix the module with screws if it is subject to vibration during use. Tighten the screws within the range of specified torque. If the screws are loose, it may cause the module to fallout, short circuits, or malfunction. If the screws are tightened too much, it may cause damage to the screw and/or the module, resulting in fallout, short circuits or malfunction.
- Switch all phases of the external power supply off when mounting or removing the module. Otherwise, the module may be damaged.
- Do not directly touch the conductive area or electronic components of the module. Otherwise, the module may malfunction or go down.

### WIRING PRECAUTIONS

#### CAUTION

- Always ground the FG terminal for the PLC. There is a risk of electric shock or malfunction.
- When turning on the power and operating the module after wiring is completed, always attach the terminal cover included with the product. There is a risk of electric shock if the terminal cover is not attached.
- Tighten the terminal screws within the range of specified torque. If the terminal screws are loose, it may result in short circuits or malfunction. If the terminal screws are tightened too much, it may cause damage to the screw and/or the module, resulting in short circuits or malfunction.
- Be careful not to let foreign matters such as sawdust or wire chips get inside the module. These may cause fires, failure or malfunction.
- The top surface of the module is covered with protective film to prevent foreign objects such as cable offsets from entering the module when wiring. Do not remove this film until the wiring is complete. Before operating the system, be sure to remove the film to provide adequate heat ventilation.

### Manual

The following manual is also related to this product. Order them if necessary.

#### Related Manual

Manual Name	Manual No. (Model code)
Channel Isolated High Resolution Analog-Digital Converter Module Channel Isolated High Resolution Analog-Digital Converter Module (with Signal Conditioning Function) User's Manual	SH-080277 (13JR51)

Conformation to the EMC Directive and Low Voltage Instruction  
When complying with EMC Directives and Low-Voltage Directives by assembling a Mitsubishi PLC compatible with EMC Directive and Low-Voltage Directives into the user product, refer to Chapter 3 "EMC Directives and Low-Voltage Directives" in the User's Manual (Hardware Section) for the CPU module being used. The CE logo is printed on the rating plate on the main body of the PLC that conforms to the EMC directive and low voltage instruction.

## 1. Overview

This manual explains the specifications and part names for the type Q62AD-DGH Channel Isolated High Resolution Analog-Digital Converter Module (with Signal Conditioning Function) (hereinafter Q62AD-DGH) to be used in combination with the MELSEC-Q Series CPU module.

## 2. Specifications

The specifications for the Q62AD-DGH are shown in the following table. For general specifications for the Q62AD-DGH, refer to the operation manual for the CPU module being used.

Item	Model name	Q62AD-DGH
Connecting section with 2-wire transmitter	Input specification	2 points (2 channels)
	Number of analog input	4 to 20 mA DC (Input resistance 250 Ω)
	Supply voltage	24±2VDC
	Supply power specification	24mA DC
Check terminals	Maximum supply current	Available
	Short-circuit protection	Limit current: 25 to 35mA
Digital output	Check terminals	Available
I/O characteristics, Maximum resolution	Digital output	16-bit signed binary (-768 to 32767) 32-bit signed binary (-1538 to 65535)
	Analog input range	Maximum resolution: 32-bit 16-bit 4 to 20mA 250.0mA 500.0mA Users range setting 151.6mA 303.2mA
	Digital output value (32-bit)	0 to 64000
	Digital output value (16-bit)	0 to 32000
Accuracy (Accuracy relative to full-scale)	Reference accuracy <sup>2</sup> Temperature coefficient <sup>4</sup>	Digital output value (32-bit): ±32digit <sup>3</sup> Digital output value (16-bit): ±16digit <sup>3</sup>
Conversion speed		10ms/2 channels
Insulation	Isolated part	Between I/O terminal and PLC power supply
	Insulation method	Photocoupler insulation
	Dielectric strength	1780VAC rms /3 cycles (elevation 2000m)
	Isolation voltage	500VDC 10MΩ more
EPROM write count		Maximum 100,000
Number of I/O occupied points		16 points
Connected terminal		18 points terminal block
Applicable wire size		0.3 to 0.75mm <sup>2</sup>
Applicable solderless terminals		R1.25 - 3 (A solderless terminals with sleeves cannot be used)

Item	Model name	Q62AD-DGH
External supply power		24VDC +20%, -15%
		Ripple, spike within 500mV/p-p
		Inrush current : 5.5A, within 200μs
Internal current consumption (5 VDC)		0.36A
Weight		0.22A
		0.19kg

- \*1: User range setting is 2 to 24mA.  
\*2: Accuracy of offset/gain setting at ambient temperature  
Q62AD-DGH needs to be powered on 30 minutes prior to operation for compliance to the specification (accuracy).  
\*3: "digit" indicates a digital output value.  
\*4: Accuracy per temperature change of 1 °C  
Example: Accuracy when temperature changes from 25 to 30 °C  
0.05% (reference accuracy) + 0.00714 %/°C (temperature coefficient) × 5 °C (temperature change difference) = 0.0857%

## 3. Part Names

This section explains the part names for the Q62AD-DGH.

Terminal number	Signal name *
1	P
2	CH1
3	I/CHK+ CHK-
4	Empty
5	Empty
6	Empty
7	Empty
8	Empty
9	P
10	CH2
11	I/CHK+ CHK-
12	Empty
13	Empty
14	Empty
15	Empty
16	24V
17	24G
18	FG

Number	Name	Description
1)	RUN LED	Displays the operating status of the Q62AD-DGH. On : Normal operation Flickering : During offset/gain setting mode Off : 5V power supply interrupted, watch dog timer error or module exchangeable status during online module replacement
2)	ERR. LED	Displays the error status of the Q62AD-DGH. On : Error (A/D conversion continues.) Flickering : Error (A/D conversion stops.) Off : Normal operation
3)	ALM LED	Displays the alarm status of the Q62AD-DGH. On : An alarm (process alarm, rate alarm) is being generated. Flickering : An input signal error is being generated. Off : Normal operation
4)	Check terminals	Terminal used to check the analog input current value. (See Section 5.2)
5)	External supply power terminal	Terminal to connect 24VDC external supply power.

## 4. Precautions For Use

- Do not drop the module case or subject it to strong impact.
- Do not remove the PCB of the module from its case. This may cause the module to fail.
- Be careful not to let foreign particles such as swarf or wire chips enter the module. They may cause a fire, mechanical failure or malfunction.
- The top surface of the module is covered with a protective film to prevent foreign objects such as wire burrs from entering the module during wiring. Do not remove this film until the wiring is complete. Before operating the system, be sure to remove the film to provide adequate ventilation.
- Tighten the terminal screws for the module to the specified torque shown below. Insufficient tightening torque could result in shorts, failures or malfunction.

Screw location	Tightening torque range
Module mounting screw (M3 screw)	36 to 48 N · cm
Terminal block terminal screw (M3 screw)	42 to 58 N · cm
Terminal block mounting screw (M3.5 screw)	66 to 89 N · cm

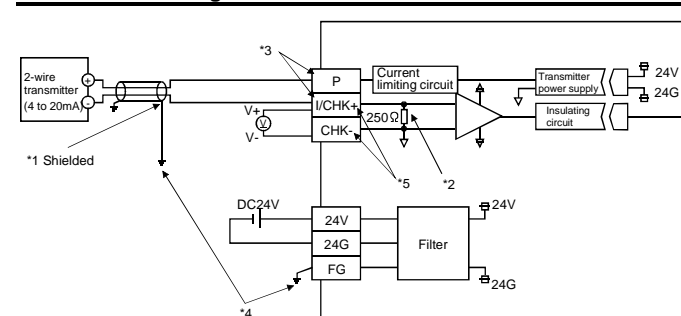
- To mount the module on the base, securely insert the module fastening latch into the fastening hole on the base. Incorrect mounting may result in a module malfunction, or may cause the module to fall off.

## 5. Wiring

### 5.1 Wiring precautions

- Wire the external AC control circuit and the external input signal for Q62AD-DGH and the external supply power with the separate cables to prevent the influence of surge or induction from AC side.
- Do not mount the cables close to or bundle them with main circuit line, a high-voltage cable or load cable from other than the PLC. This may increase the effects of noise, surges and induction.
- Ground one point of the shield for shielded wires or shielded cables.
- A solderless terminal with insulation sleeve cannot be used for the terminal block. It is recommended to cover the cable-connection portion of the solderless terminal with a marked tube or an insulation tube.

### 5.2 External wiring



- Use a 2-core twisted shielded wire for the power wire.
- Shows input resistance.
- To connect with the 2-wire transmitter, be sure to connect to P and I/CHK+.
- Always use a ground. In addition, ground the FG of the power supply module.
- The check terminals (I/CHK+, CHK-) are used to check the amount of input in mA in relation to the 2-wire transmitter output. This can be checked since analog inputs of 4 to 20mA are converted to analog outputs of 1 to 5V. The relationship of this conversion can be expressed by the following formula:  
Analog output (V) =  $\frac{\text{Analog input (mA)}}{1000} \times 250 \Omega$

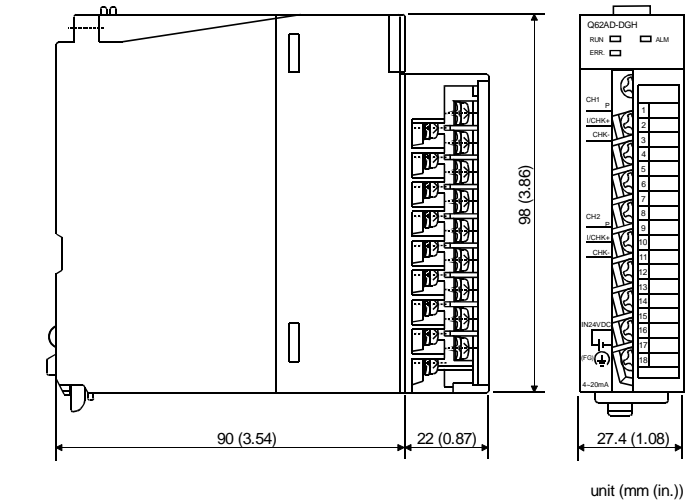
**IMPORTANT**  
Q62AD-DGH needs to be powered on 30 minutes prior to operation for compliance to the specification (accuracy). Therefore, power on 30 minutes prior to offset/gain setting or after online module replacement.

### 5.3 Switch setting for intelligent functional module

The settings for the intelligent functional module are performed using the I/O allocation settings for the GX Developer. It can be easy to set by inputting in hexadecimal-4digits.

Switch	Setting									
Switch 1	<table border="1"> <tr> <th>Setting</th> <th>Analog input range</th> <th>Input range setting value</th> </tr> <tr> <td>00H Fixed</td> <td>4 to 20 mA</td> <td>0 H</td> </tr> <tr> <td></td> <td>User range setting</td> <td>F H</td> </tr> </table>	Setting	Analog input range	Input range setting value	00H Fixed	4 to 20 mA	0 H		User range setting	F H
Setting	Analog input range	Input range setting value								
00H Fixed	4 to 20 mA	0 H								
	User range setting	F H								
Switch 2	Empty									
Switch 3	Empty									
Switch 4	<table border="1"> <tr> <th>Setting</th> <th>00H Fixed</th> </tr> <tr> <td>0H</td> <td>Normal mode (A/D conversion processing)</td> </tr> <tr> <td>1 to FH</td> <td>(numeric value other than 0H) : Offset/gain setting mode</td> </tr> </table>	Setting	00H Fixed	0H	Normal mode (A/D conversion processing)	1 to FH	(numeric value other than 0H) : Offset/gain setting mode			
Setting	00H Fixed									
0H	Normal mode (A/D conversion processing)									
1 to FH	(numeric value other than 0H) : Offset/gain setting mode									
Switch 5	0 : Fixed									

## 6. External Dimensions



unit (mm (in.))

### Warranty

Mitsubishi Electric shall not be liable for any loss caused by reasons for which Mitsubishi is not held accountable, lost business opportunities or unrealized gain on the customer's side resulting from failure of the product, or any other damage, secondary disaster, accident, damage to equipment other than the product or disruption of other business operations arising out of special circumstances which may or may not have been predicted at Mitsubishi.

#### For safe use of the product

- This product is manufactured as a general-purpose product intended for general industrial use only. It is not designed nor manufactured for use in an equipment or system affecting human lives.
- If you are considering to use this product in equipment or systems for nuclear power generation, power generation, aerospace, medical or passenger transport applications, consult our sales representatives.
- This product is manufactured under our strict quality control system. However, if the product is used in the intended facility in such a way that a failure of the product may lead to serious accident or loss, incorporate backup or fail-safe functions into the system design.

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Specifications subject to change without notice.  
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