MITSUBISHI **QA6ADP QA Conversion Adapter Module**

User's Manual

QA6ADP

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

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



Mitsubishi **Programmable Controller**

| MODEL | QA6ADP-U-JE |
|-------|-------------|
| MODEL | 13JY50 |
| CODE | 153150 |

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GENERIC TERMS AND ABBREVIATIONS

Unless otherwise specified, this manual uses the following generic terms and abbreviations to explain the QA conversion adapter module.

| Generic term/Abbreviation | Description |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A5⊟B | Generic term for A52B, A55B, and A58B extension base units on which A series I/O module and special function module can be mounted without power supply. |
| A6⊟B | Generic term for A62B, A65B, and A68B extension base units on which A series I/O module and special function module can be mounted. |
| QA6ADP | Abbreviation for QA6ADP QA conversion adapter module. |
| QA6ADP+A5□B/A6□B | Abbreviation for A large type extension base unit on which QA6ADP is mounted. |

1. OVERVIEW

1.1 Overview

This user's manual describes the specifications, configuration device, part names and setting, and implementation and installation of the QA6ADP QA conversion adapter module.

For contents that are not described in this manual such as safety precautions, EMC and low voltage directives, or error code list, refer to QCPU User's Manual (Hardware Design, Maintenance and Inspection) (SH-080483).

The QA6ADP is the adapter module connecting the A (large type) series extension base unit to the Q series main base unit.



POINT

- The QA6ADP is CE-compliant. To meet the EMC directive, the extension base unit and module to be used in combination with the QA6ADP should be CE-compliant.
- When using a control line or communication cable, keep it away from the main circuit or power line 100mm or more.

 Failure to do as may assure malfunction due to point.

Failure to do so may cause malfunction due to noise.

1.2 Included Parts

This section describes parts included with this module.

| Product name | Model | Quantity | Remarks |
|-------------------------------------|--------|----------|---------|
| QA6ADP QA conversion adapter module | QA6ADP | 1 | — |
| Adapter module mounting bracket | — | 1 | — |
| Mounting bracket fixing screw | — | 1 | — |
| Board fixing screw | — | 1 | — |
| This manual | — | 1 | — |

2. SYSTEM CONFIGURATION

2.1 System Configuration

This section describes the system configuration and restrictions when the QA6ADP is used.

- (1) The QA6ADP+A5 B/A6 B is only applicable for the High Performance model QCPU (Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, and Q25HCPU).
- (2) Mount the Q5 B/Q6 B, QA6 B, and QA6ADP+A5 B/A6 B in order from the nearest position of the main base unit. The QA6ADP cannot be used in combination with the QA1S6 \Box B.
- (3) The number of slots of the QA6ADP+A5DB/A6DB is always displayed in 8 slots, regardless of the number of slots of the extension base unit to be used in combination with the QA6ADP. Assign the I/O number of a module, putting each series in block and in order of "Q series \rightarrow A series" or "A series \rightarrow Q series". Failure to do so may cause an error (SP.UNITLAY ERR). In addition, do not duplicate the I/O number.
- (4) For the extension stage number setting of the extension base unit, set stage number (the first to seventh stages) to extension stages from the one nearest to the main base unit.
- (5) An extension cable connectable to the QA6ADP is the Q series extension cable only.
- (6) Set the same stage number to both the stage number setting connector of the extension base unit and that of the QA6ADP.
- (7) The QA6ADP+A5 B/A6 B cannot be used as the MELSECNET/H remote I/O station.
- (8) The bus connection with GOT is not available for the QA6ADP+A5□B/ A6□B.

[Extension stage number setting]

•• 1

•• 2



Power supply

••

QA6ADP

····· Q38B Main base unit 8 9 10 11 12 13 14 15 Q series compatible extension base unit • Q68B (The Q5 B/Q6 B is connected to the main base unit or the $Q5\square B/Q6\square B$.) 16 17 18 19 20 21 22 23 A series compatible extension base unit Power (The QA6□B is connected to the main · · · QA68B base unit, the end of the $Q5\square B/Q6\square B$, or the QA6 \square B.) 24 25 26 27 28 29 30 31 A series compatible extension base unit Powel ••• A68B

(The QA6ADP+A5DB/A6DB is connected to the main base unit, the end of the Q5
B/Q6
B/QA6
B, or the QA6ADP +A5□B/A6□B.)

2.2 Configuration Device List

(1) Extension base unit mountable on the QA6ADP

The following shows extension base units that can be mounted on the QA6ADP.

| Product name | | Model | | Remarks |
|--------------------------|----------|---------|-------|---------|
| Extension base unit | A52B, | A55B, | A58B, | |
| (Power supply module not | A55B-UL, | A58B-UL | | |
| mounting type) | | | | |
| Extension base unit | A62B, | A65B, | A68B, | |
| (Power supply module | A65B-UL, | A68B-UL | | |
| mounting type) | | | | |

(2) Module mountable on the extension base unit where the QA6ADP is mounted

The following shows modules that can be mounted on the extension base unit where the QA6ADP is mounted.

| Product name | | Model | | Remarks |
|--------------------------|----------|----------|----------|---------|
| Power supply module | A61P, | A61PN, | A62P, | |
| | A63P, | A61PEU, | A62PEU | |
| Power supply module | A68P | | | |
| (I/O slot mounting type) | | | | |
| AC input module | AX10, | AX11, | AX11EU, | *6 |
| | AX20, | AX21, | AX21EU | 0 |
| AC/DC input module | AX31, | AX31-S1 | | |
| DC input module | AX40, | AX41, | AX41-S1, | |
| | AX42, | AX42-S1, | AX50-S1, | |
| | AX60-S1, | AX70, | AX71, | |
| | AX80, | AX80E, | AX81, | |
| | | AX81-S2, | AX81-S3, | |
| | AX81B, | | | |
| Contact output module | AY10, | , | AY11, | |
| | | AY11E, | | |
| | - | AY13, | AY13E, | |
| | AY13EU, | | | |
| Triac output module | AY22, | AY23 | | |
| Transistor output module | AY40, | AY40A, | AY41, | |
| | AY42, | AY42-S1, | AY42-S2, | |
| | AY42-S3, | AY42-S4, | AY50, | |
| | | AY51-S1, | , | |
| | , | AY60E, | • | |
| | , | AY72, | AY80, | |
| | AY81, | AY82EP | | |
| Dynamic I/O module | A42XY | | | |
| Combined I/O module | AH42 | | | |

| Product name | | Model | | Remarks |
|-----------------------------------------|--------------------------|-----------------------|---------|---------|
| High-speed counter module | AD61, | AD61S1 | | *1 |
| A/D converter module | A68AD, A616AD | A68AD-S2, | A68ADN, | |
| D/A converter module | A62DA, A68DAI-S1, | A62DA-S1, A616DAV, | , | |
| Temperature-digital converter module | , | A68RD4N, A60MXRN, | , | |
| Interrupt module | Al61, | AI61-S1 | | *2 |
| Positioning module | AD70, | AD72 | | |
| | , | AD75M2, AD75P2-S3, | , | *1 |
| A-A1S module conversion adapter | A1ADP-XY, | A1ADP-SP | | *3 *4 |
| MELSECNET/MINI-S3 master module | AJ71PT32-S AJ71T32-S3 | • | | *1 |
| Intelligent communication module | AD51, AD51H-S3 | AD51-S3, | AD51H, | *2 |
| PC fault detection module | AS91 | | | |
| MELSEC-I/OLINK module | AJ51T64 | | | |
| B/NET interface module | AJ71B62-S3 | } | | |
| Blank cover | AG60 | | | |
| Dummy module | AG62 | | | |

*1: The dedicated instructions used in the QnA/A series program cannot be used in the QCPU.

Replace the dedicated instructions with the FROM/TO instructions.

*2: There is restriction on the number of mountable modules.

| Product name | Model | | Model | | No. of mountable modules |
|----------------------------------|-----------------|----------------------|-------|--|--------------------------|
| Intelligent communication module | AD51, AD51H, | AD51-S3, AD51H-S3 | 6 | | |
| Interrupt module | Al61, | AI61-S1 | 1 *5 | | |

- *3: Using the A-A1S module conversion adapter enables to use modules equivalent to the AnS module by the module shown in the table. For the mountable modules, refer to A-A1S Module Conversion Adapter User's Manual (IB-0800352).
- *4: Only the multidrop link function can be used with the A1SJ71UC24-R4+A1ADP.
- *5: The interrupt module can use only one out of the QI60 (when mounted on the Q3□B, Q5□B or Q6□B), AI61, and AI61-S1.
- *6: The normal operation of A series AC input module can be guaranteed only when the base unit on which the A series power supply module is mounted exists in the system. Make sure that the following condition is satisfied when A series AC input module is used.
 - A series AC input module is mounted on the QA6 \Box B or QA6ADP+A6 \Box B.
 - A series AC input module is mounted on the QA6ADP+A5□B. However, A series compatible extension base unit, QA6□B or QA6ADP+A6□B, exists in the system.

3. SPECIFICATIONS

3.1 General Specifications

This section describes general specifications of the QA6ADP.

| Item | 0 | Specifications | | | | |
|-------------------------------|----------------------------------------------------------------------------------------------------|---------------------------|--------------|----------------------|-------------------------|-----------------------|
| Operating ambient temperature | 0 to 55 °C | | | | | |
| Storage ambient temperature | | -20 to 75 °C | | | | |
| Operating ambient humidity | | 10 to | 90 % RH, No- | condensir | ng | |
| Storage ambient humidity | | 10 to | 90 % RH, No- | condensir | ng | |
| | | | Frequency | Accelera -tion | Amplitude | Sweep count |
| Vibratian | Conforming | Under | 10 to 57 Hz | | 0.075 mm | 10 times |
| Vibration resistance | to JIS B 3502, IEC 61131-2 | | 57 to 150 Hz | 9.8 m/s ² | | each in X, Y, Z |
| | | Under continuous | 10 to 57 Hz | | 00.35 mm (0.001 in.) | directions (for 80 |
| | | vibration | 57 to 150 Hz | | | min). |
| Shock resistance | Conforming to JIS B 3502, IEC 61131-2 (147 m/s ² , 3 times in each of 3 directions XYZ) | | | | | |
| Operation ambiance | | No corrosive gasses | | | | |
| Operating elevation *3 | | 2000 m (6562 ft.) or less | | | | |
| Installation location | Control panel | | | | | |
| Overvoltage category *1 | II max. | | | | | |
| Pollution degree *2 | 2 max. | | | | | |
| Equipment category | | Class I | | | | |

*1: This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises.

Category II applies to equipment for which electrical power is supplied from fixed facilities.

The surge voltage withstand level for up to the rated voltage of 300 V is 2500 V.

*2: This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used.

Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.

*3: Do not use or store the PLC in the environment when the pressure is higher than the atmospheric pressure at sea level.

Otherwise, malfunction may result.

To use the PLC in high-pressure environment, please contact your local Mitsubishi Repress entative.

3.2 Performance Specifications

This section describes performance specifications of the QA6ADP.

| Item | Specifications |
|------------------------------------|--------------------------------------------------------------------------------|
| 5VDC internal current consumption | 110 mA |
| External dimensions *1 | 130 mm (5.11 inch) (H) × 73.5 mm (2.89 inch) (W) × 74 (2.91 inch) mm (D) |
| Weight | 0.2 kg |
| Adapter mounting screw (M3) torque | 0.36 to 0.48 N•m |
| Board fixing screw torque | 0.61 to 0.82 N•m |

*1: The external dimensions show values in a status where the QA6ADP is mounted on the extension base unit.

4. PART NAMES AND SETTING

4.1 Part Names

This section describes part names of the QA6ADP.



4.2 Extension Stage Number Setting

Set the number of extension stages to both the QA6ADP and the extension base unit.

The same stage number should be set to both the stage number setting connector of the extension base unit and that of the QA6ADP.

POINT

Set any number of 1 to 7 which matches to the number of extension stages for the stage number setting connector setting. If the stage number setting of the QA6ADP and that of the extension base unit is different, the two or more settings are made to one stage, the same stage number is duplicated, or no setting is made to the number of stages, incorrect input or incorrect output will occur.

(1) Extension stage number setting of the QA6ADP

The following describes how to set the number of extension stages of the QA6ADP.

| | Extension stage number setting | | | | | | |
|----------------------------------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | 1 st stage | 2 nd stage | 3 rd stage | 4 th stage | 5 th stage | 6 th stage | 7 th stage |
| Stage number setting connector setting | ○ ○ 1 ○ ○ 3 ○ ○ 4 ○ ○ 6 ○ ○ 7 | ○ ○ 1 ○ ○ 3 ○ ○ 4 ○ ○ 6 ○ ○ 6 ○ ○ 7 PIN1 | ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○< 7 PIN1 | ○ 1 ○ 2 ○ 3 ● 4 ○ 5 ○ 6 ○ 7 PIN1 | ○ 1 ○ 0 ○ 0 3 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 • 0 | ○ 1 ○ 2 ○ 3 ○ 4 ○ 6 ○ 7 PIN1 | ○ 1 ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ● ○ ● ○ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● |

(2) Extension stage number setting of the extension base unit





Stage number setting connector

| | Extension stage number setting | | | | | | |
|----------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------|
| | 1 st stage | 2 nd stage | 3 rd stage | 4 th stage | 5 th stage | 6 th stage | 7 th stage |
| Stage number setting connector setting | UNIT 1 00 1 2 00 3 4 00 4 5 00 6 7 00 7 CON3 | UNIT 1 0 0 1 2 0 0 0 3 4 4 0 0 0 6 6 7 0 0 0 7 CON3 | UNIT 1 00 1 2 00 2 3 4 00 4 5 00 6 7 00 7 CON3 | UNIT 1 00 1 2 00 3 4 00 6 6 00 6 7 00 7 CON3 | UNIT 1 00 1 2 00 3 4 00 4 5 00 6 7 00 7 CON3 | UNIT 1 00 1 2 00 3 4 00 4 5 00 6 7 00 7 CON3 | UNIT 1 000 2 000 4 000 6 7 CON3 |

5. LOADING AND INSTALLATION

5.1 Mounting/Removal of QA6ADP

(1) Mounting of the QA6ADP

The following shows procedures for mounting the QA6ADP on the extension base unit.



(2) Removal of the QA6ADP

The following shows procedures for removing the QA6ADP from the extension base unit.



5.2 Connection/Disconnection of Extension Cable

- (1) Precautions for handling an extension cable
 - Do not step on an extension cable.
 - When laying an extension cable, the minimum bend radius of the cable should be 55 mm (2.17 inch) or more. If it is less than 55 mm (2.17 inch), malfunction may occur due to characteristic deterioration, wire break etc.
 - When connecting or disconnecting an extension cable, do not hold ferrite cores mounted at both ends of the cable. In case of connecting/disconnecting a cable, hold the connector part of the cable.



Holding a ferrite core may cause cable break inside the connector. Also, if the ferrite core is shifted, the characteristic will change. When handling the cable, take care not to change position of the ferrite core.

(2) Connection of extension cable

The following shows extension cables connectable to the QA6ADP.

| Model | Remarks |
|--------|-------------|
| QC05B | 0.45m cable |
| QC06B | 0.6m cable |
| QC12B | 1.2m cable |
| QC30B | 3m cable |
| QC50B | 5m cable |
| QC100B | 10m cable |

POINT

When connecting the base unit of the previous stage and the QA6ADP with an extension cable, be sure to connect the OUT side connector of the base unit of the previous stage and the IN side connector of the QA6ADP. If an extension cable is connected in the wrong way (IN \rightarrow IN, OUT \rightarrow OUT or IN \rightarrow OUT), the system will not operate normally. • To connect an extension cable to the QA6ADP, remove a sticker on the IN side connector.



• To connect an extension cable to the OUT side connector of the QA6ADP, remove the portion (lid) under the characters "OUT" by tools such as a flathead screwdriver (5.5×75, 6×100).



• Hold the connector part of an extension cable when connecting the extension cable to the QA6ADP.



 Make sure to tighten fixing screws of the extension cable connector after connecting the extension cable. (Tightening torque: 0.20 N m)



(3) Disconnection of extension cable

When disconnecting an extension cable, hold and pull the connector part of the extension cable after making sure that fixing screws have been completely removed.

6. PRECAUTION FOR USING QA6ADP

6.1 Current Consumption of QA6ADP

Since 5VDC is supplied to the QA6ADP from the power supply module of the main base unit, take the current consumption of the QA6ADP into consideration when selecting the power supply module for the main base unit.

| $\begin{array}{ c c c c c c c c c c c c c c c c c c c$ |
|--------------------------------------------------------|
|--------------------------------------------------------|

n: Quantity of QA6ADP in system*1

*1 The quantity of the QA6ADP includes the QA6ADP when the A6 B is used.

The following shows the concept of the current consumption of the power supply module mounted on the main base unit.



| Symbol | Description | | |
|----------|-----------------------------------------------------------------------------------------|--|--|
| | Rated current of power supply module on the main base unit | | |
| 10 | Current consumption of CPU and I/O modules mounted on the main base unit | | |
| 11 to 14 | Current consumption of I/O mounted on the extension base unit in first to fourth stages | | |
| IA | Current consumption of the QA6ADP | | |

In case of the above system, use the QA6ADP when the current consumption of the power supply module mounted on the main base unit meets the following formula.

[Calculating formula]

 $I > I0 + I2 + I3 + IA \times 3$

6.2 Voltage Drop of Extension Cable

Since 5VDC is supplied to the QA6ADP from the power supply module mounted on the main base unit, the voltage drop will be caused in the extension cable. If the specified voltage (4.75VDC or more) is not supplied to the IN side connector of the QA6ADP+A5 \square B/A6 \square B, wrong input/output may occur. When using the QA6ADP, check that the IN side connector of the QA6ADP+A5 \square B/A6 \square B has 4.75VDC or more.

The following shows an example regarding how to calculate the voltage drop.



| Symbol | Description | | | |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| V | Sum of voltage drop | | | |
| V1 | Voltage drop due to an extension cable between the main base unit and the QA6□B | | | |
| Vn | Voltage drop due to an extension cable between the extension base unit (n-1th extension stage) and the extension base unit (nth extension stage) | | | |
| R1 | Resistance value of a cable between the main base unit and the extension base unit QA6 | | | |
| Rn | Rn Resistance value of an extension cable between the extension base un (n-1th extension stage) and the extension base unit (nth extension stage) | | | |
| I1 to I3 | 5VDC current consumption in the first to third stages *1 | | | |
| IA | Current consumption of the QA6ADP | | | |

*1: Since the current consumptions I1 to I3 vary depending on modules to be mounted, refer to the manual for the module to be mounted.

[Calculating formula]

 $V = V1 + V2 + V3 = R1 \times (I2 + IA \times 2) + R2 \times (I2 + IA \times 2) + R3 \times IA$

The minimum value of the 5VDC output voltage of the power supply module mounted on the main base unit is set to 4.90VDC. Therefore, the voltage of the IN side connector of the QA6ADP+A5DB/A6DB in the final stage is 4.75VDC or more only when the sum (V) of voltage drop is 0.15V or less.

7. COMPATIBLE MODELS LIST

This chapter describes external dimensions of the QA6ADP.



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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