



QA1S6ADP Q-AnS Base Unit Conversion Adapter

User's Manual

QA1S6ADP

Thank you for purchasing the Mitsubishi Electric MELSEC-AnS series programmable controllers.

Before using this product, please read this manual and relevant manuals carefully to handle the product correctly.

MODEL	QA1S6ADP-U-JE
MODEL CODE	13J228
IB(NA)-0800538-C(1806)MEE	

CONDITIONS OF USE FOR THE PRODUCT

- (1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
- i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
 - ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.
- (2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.

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TERMS

Unless otherwise specified, this manual uses the following terms.

Term	Description
A1S5□B	A generic term for the A1S52B, A1S55B, and A1S58B extension base units (type requiring no power supply module) where AnS series I/O modules and special function modules can be mounted
A1S6□B	A generic term for the A1S65B and A1S68B extension base units (type requiring power supply module) where AnS series I/O modules and special function modules can be mounted
QA1S6ADP	The abbreviation for the QA1S6ADP Q-AnS base unit conversion adapter
QA1S6ADP+A1S5□B/A1S6□B	The abbreviation for the AnS series extension base unit with the QA1S6ADP mounted

1 OVERVIEW

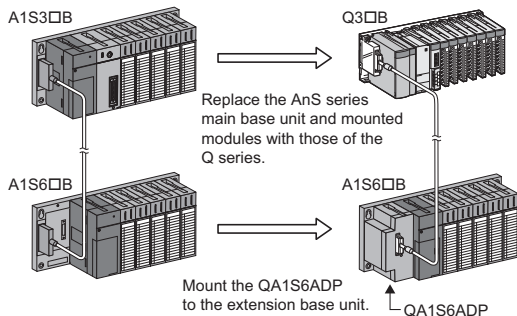
1.1 About This Manual

This manual describes the specifications, configuration devices, part names, and mounting and installation methods of the QA1S6ADP Q-AnS base unit conversion adapter. For contents that are not described in this manual, such as safety precautions and EMC and Low Voltage Directives, refer to the Safety Guidelines. For the error codes of the CPU module, refer to the QCPU User's Manual (Hardware Design, Maintenance and Inspection).

Pour les contenus qui ne sont pas décrites dans ce manuel, tels que les mesures de sécurité et EMC et directives basse tension, reportez-vous aux Safety Guidelines (directive de sécurité). Pour les codes d'erreur du module de CPU, reportez-vous au "QCPU User's Manual (Hardware Design, Maintenance and Inspection)" (le Manuel de l'utilisateur QCPU (conception du matériel, maintenance et inspection)).

1.2 QA1S6ADP

The QA1S6ADP is an adapter to connect an AnS series extension base unit to a Q series base unit.



Point

- The QA1S6ADP is a CE-marked product. To comply with the EMC Directive, the extension base units and modules used in combination with the QA1S6ADP must be CE-compliant as well.
- 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 noise.

1.3 Packing List

The following items are included in the package of this product.

Item	Quantity
Adapter (QA1S6ADP)	1
Special metal fixture A	1
Special metal fixture B	1
Adapter mounting screw (M3×6)	3
Special metal fixture mounting screw (M5×25)	2
Special metal fixture mounting screw (M5×28)	2
Plain washer (M5)	3
Fixing screw cover	2
This manual	1

1.4 Related Product (Sold Separately)

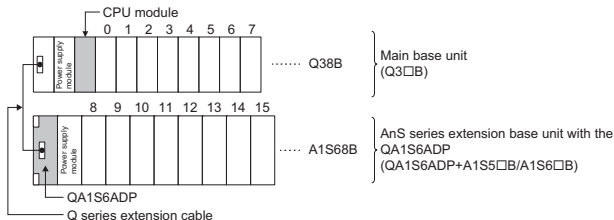
The following item (sold separately) is required to use the QA1S6ADP.

Item	Model	Remarks
Q series extension cable	QC05B	This cable is required to connect the AnS series extension base unit with the QA1S6ADP mounted to the Q series main base unit.
	QC06B	
	QC12B	
	QC30B	
	QC50B	
	QC100B	

2 SYSTEM CONFIGURATION

2.1 System Configuration Example

The following system can be configured using the QA1S6ADP.



2.2 Restrictions

This section describes the restrictions when the QA1S6ADP is used.

Applicable CPU modules

The following CPU modules support the connection with the QA1S6ADP+A1S5□B/A1S6□B.

- High Performance model QCPU
- Universal model QCPU with a serial number (first five digits) of "13102" or later

Base unit connection

- The QA1S6ADP+A1S5□B/A1S6□B can be connected to the main base unit only.
- When the QA1S6ADP+A1S5□B/A1S6□B is used, the number of extension base units is limited to one.

Software

- The number of slots of the QA1S6ADP+A1S5□B/A1S6□B is always displayed as eight in GX Works2 or GX Developer, regardless of the actual number of slots of the extension base unit where the QA1S6ADP is mounted.
- Batch assign I/O numbers to the modules by the series, in order of "Q series → AnS series" or "AnS series → Q series". If not, an error (SP.UNITLAY ERR) occurs. Assign I/O numbers so that they do not overlap.

Restricted functions

The QA1S6ADP+A1S5□B/A1S6□B cannot be connected to a MELSECNET/H remote I/O station.

The QA1S6ADP+A1S5□B/A1S6□B cannot be bus-connected with GOT.

2.3 Configuration Devices

Applicable base units

The following table lists the extension base units where the QA1S6ADP can be mounted.

Name	Model	Remarks
Extension base unit (type requiring no power supply module)	A1S52B, A1S55B, A1S58B	—
Extension base unit (type requiring power supply module)	A1S65B, A1S68B	—

Mountable modules

The following table lists the modules mountable on the QA1S6ADP+A1S5□B/A1S6□B.

Name	Model	Remarks
Power supply module	A1S61PN, A1S62PN, A1S63P	—
AC input module	A1SX10, A1SX10EU, A1SX20, A1SX20EU	—
AC/DC input module	A1SX30	—
DC input module	A1SX40, A1SX40-S1, A1SX40-S2, A1SX41, A1SX41-S1, A1SX41-S2, A1SX42, A1SX42-S1, A1SX42-S2, A1SX71, A1SX80, A1SX80-S1, A1SX80-S2, A1SX81, A1SX81-S2, A1SX82-S1	—
Dynamic input module	A1S42X	—
Relay output module	A1SY10, A1SY10EU, A1SY14EU, A1SY18A, A1SY18AEU	—
Triac output module	A1SY22, A1SY28A	—
Transistor output module	A1SY40, A1SY40P, A1SY41, A1SY41P, A1SY42, A1SY42P, A1SY50, A1SY60, A1SY60E, A1SY68A, A1SY71, A1SY80, A1SY81, A1SY82	—
Dynamic output module	A1S42Y	—
I/O combined module	A1SH42, A1SH42-S1, A1SX48Y58, A1SX48Y18	—
High-speed counter module	A1SD61, A1SD62, A1SD62E, A1SD62D, A1SD62D-S1	*1
A/D converter module	A1S64AD, A1S68AD	—
D/A converter module	A1S62DA, A1S68DAI, A1S68DAV	—
Analog input/output module	A1S63ADA, A1S66ADA	—
Temperature input module	A1S62RD3N, A1S62RD4N, A1S68TD	—
Temperature control module	A1S62TCRTBW-S2, A1S62TCRT-S2, A1S62CTTBW-S2, A1S62CTT-S2, A1S64TCRTBW-S1, A1S64TCRT-S1, A1S64CTRT, A1S64TCRTBW, A1S64CTTBW-S1, A1S64CTT-S1	—
Pulse catch module	A1SP60	—
Analog timer module	A1ST60	—
Interrupt module	A1SI61	*3
Positioning module	A1SD70	—
	A1SD75M1, A1SD75M2, A1SD75M3, A1SD75P1-S3, A1SD75P2-S3, A1SD75P3-S3	*1
MELSECNET/MINI-S3 master module	A1SJ71PT32-S3	*1
Computer link module	A1SJ71UC24-R4	*2*3

Name	Model	Remarks
Intelligent communication module	A1SD51S	*3
MELSECNET, MELSECNET/B local station data link module	A1SJ71AP23Q, A1SJ71AR23Q, A1SJ71AT23BQ	—
Paging interface module	A1SD21-S1	*3
Position detection module	A1S62LS	—
PC fault detection module	A1SS91	—
Memory card interface module	A1SD59J-S2	—
ID interface module	A1SD35ID1, A1SD35ID2	*3
MELSECNET-I/O LINK master module	A1SJ51T64	—
B/NET interface module	A1SJ71B62-S3	—
JEMANET (OPCN-1) interface module	A1SJ71J92-S3	*3
S-LINK master module	A1SJ71SL92N	—
AS-i master module	A1SJ71AS92	—
Blank cover	A1SG60	—
Dummy module	A1SG62	—

*1 The dedicated instructions used in the QnA series and A series programs cannot be used in the QCPU. Replace them with the FROM/TO instructions.

*2 Only the multidrop link function can be used. (The computer link function (dedicated protocol, nonprocedural protocol) can no longer be used.)

*3 The number of mountable modules is limited.

Name	Model	Number of mountable modules
Computer link module	A1SJ71UC24-R4	6 maximum
Intelligent communication module	A1SD51S	
Paging interface module	A1SD21-S1	
ID interface module	A1SD35ID1, A1SD35ID2	
JEMANET (OPCN-1) interface module	A1SJ71J92-S3	
Interrupt module	A1SI61	1*4

*4 Only one of the following modules can be used in the system: QI60 (mounted on the Q3□B, Q5□B, or Q6□B), A1SI61, AI61, or AI61-S1.

3 SPECIFICATIONS

3.1 General Specifications

This section describes the general specifications of the QA1S6ADP.

Item	Specifications					
Operating ambient temperature <i>Température ambiante de fonctionnement</i>	0 to 55°C <i>0 à 55 °C</i>					
Storage ambient temperature	-20 to 75°C					
Operating ambient humidity	10 to 90%RH, non-condensing					
Storage ambient humidity	10 to 90%RH, non-condensing					
Vibration resistance	Compliant with JIS B 3502 and IEC 61131-2	Under intermittent vibration	Frequency	Constant acceleration	Half amplitude	Sweep count
			10 to 57Hz	—	0.075mm	
		57 to 150Hz	9.8m/s ²	—		
		Under continuous vibration	10 to 57Hz	—	0.035mm	
			57 to 150Hz	4.9m/s ²	—	
Shock resistance	Compliant with JIS B 3502 and IEC 61131-2 (147m/s ² , 3 times each in X, Y, and Z directions)					
Operating atmosphere	No corrosive gases					
Operating altitude ^{*1}	0 to 2000m					
Installation location	Inside a control panel					
Overvoltage category ^{*2}	II or less					
Pollution degree ^{*3}	2 or less					
Equipment class	Class I					

*1 Do not use or store the programmable controller under pressure higher than the atmospheric pressure of altitude 0m. Doing so may cause malfunction. When using the programmable controller under pressure, please consult your local Mitsubishi Electric representative.

*2 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 300V is 2500V.

*3 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.

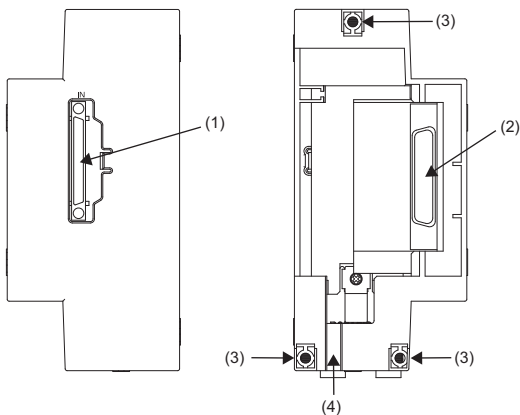
3.2 Performance Specifications

This section describes the performance specifications of the QA1S6ADP.

Item	Specifications
Internal current consumption (5VDC)	150mA
External dimensions	H 130mm
	W 62mm
	D 78.5mm
Weight	0.27kg
Tightening torque range of adapter mounting screw (M3)	0.36 to 0.48N·m
Tightening torque range of special metal fixture mounting screw (M5)	1.59 to 2.16N·m

4 PART NAMES

This chapter describes the part names of the QA1S6ADP.



No.	Name	Application
(1)	Extension cable connector	A connector for sending/receiving signals to/from the main base unit or another extension base unit. An extension cable is connected here.
(2)	Connector for extension base unit	A connector to be connected to the extension cable connector of the extension base unit
(3)	Adapter mounting screw (M3)	A screw for mounting the adapter on the extension base unit
(4)	Ground cable guide hole	A guide hole for placing the ground cable connected to the FG terminal of the extension base unit (This hole is used only when the adapter is mounted on the A1S5□B.)

5 MOUNTING AND INSTALLATION

5.1 Mounting/Removing the QA1S6ADP

Precautions

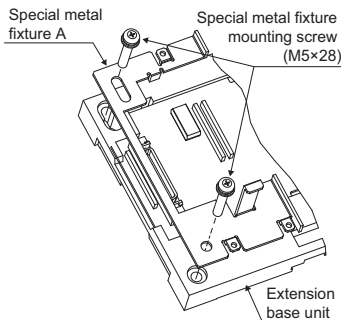
- Ground the FG terminal of the programmable controller with a ground resistance of 100Ω or less.
- When the QA1S6ADP is mounted on the A1S5□B, the ground cable connected to the FG terminal of the A1S5□B must be the one with its core wire size 2mm^2 or greater and its outside diameter 4.5mm or smaller.
- Tighten the screws within the following specified torque ranges.

Screw	Tightening torque range
Adapter mounting screw (M3)	0.36 to 0.48N-m
Special metal fixture mounting screw (M5)	1.59 to 2.16N-m

Mounting procedure

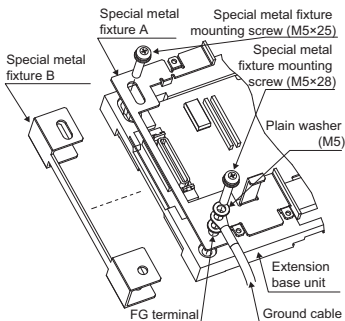
Mount the QA1S6ADP on the extension base unit, following the procedure below.

1. Disconnect the AnS series extension cable from the extension base unit.
2. Remove the base cover from the extension base unit.
3. Disconnect the ground cable from the FG terminal of the A1S5□B (when the A1S5□B is used).
4. Mount the special metal fixture in accordance with the installation conditions of the extension base unit.

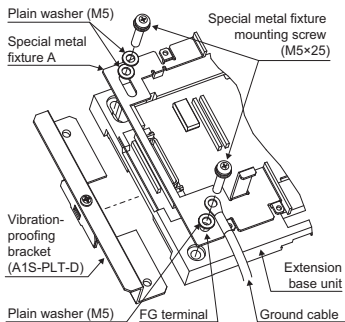


- Directly installed in the control panel
Mount the special metal fixture A as shown on the left.

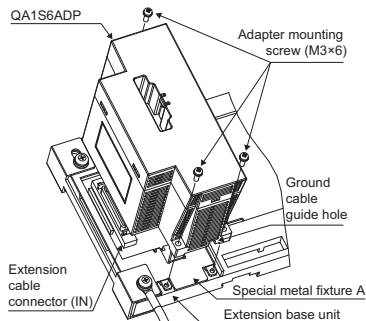
- Installed using a DIN rail
Mount the special metal fixture A, special metal fixture B, and ground cable as shown on the left.



- Installed using a DIN rail in a frequent vibration environment
Mount the special metal fixture A, vibration-proofing bracket (A1S-PLT-D) (sold separately), and ground cable as shown on the left.

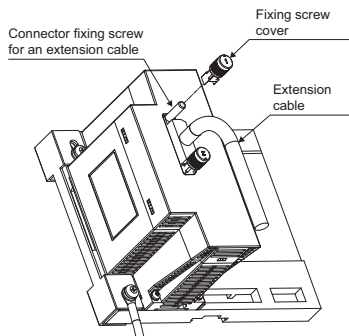


5. Connect the ground cable to the FG terminal of the A1S5□B (when the A1S5□B is used).
6. Mount the QA1S6ADP.



- Insert the connector of the QA1S6ADP to the extension cable connector (IN side) of the extension base unit, and fix the adapter with the adapter mounting screws (three locations).
- Pull out the ground cable connected to the FG terminal of the A1S5□B through the guide hole (when the A1S5□B is used).

7. Use the Q series extension cable and connect the QA1S6ADP to the main base unit.
8. Mount the provided fixing screw covers to the fixing screws of the extension cable connector.



Mount the covers marked "1" to the upper screws, and those marked "2" to the lower screws as shown on the left.

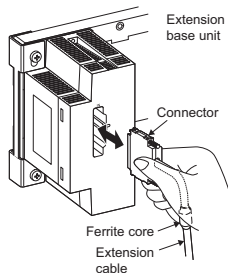
Removing procedure

Reverse the mounting procedure to remove the QA1S6ADP from the extension base unit.

5.2 Connecting/Disconnecting Extension Cables

Precautions

- When laying extension cables, maintain the minimum bending radius of 55mm or more. Failure to do so may cause malfunction due to characteristic deterioration or cable disconnection.
- Keep the overall cable distance of extension cables within 13.2m.
- Do not install extension cables together with the main circuit (high voltage and large current) lines.
- When connecting or disconnecting extension cables, do not hold the ferrite cores installed at both ends of each cable. Hold the connector part of the cable.



Holding the ferrite core may cause the cable disconnection inside the connector. Besides, keep the ferrite core in the correct position. If the ferrite core position is shifted, the characteristic will change.

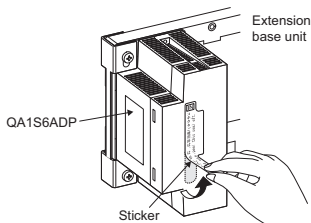
Extension cable specifications

The following table lists the extension cables that can be connected to the QA1S6ADP.

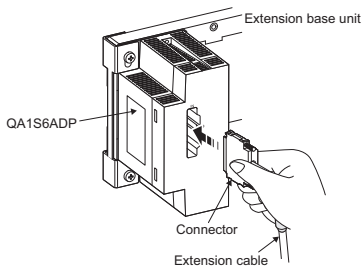
Item	Model					
	QC05B	QC06B	QC12B	QC30B	QC50B	QC100B
Length	0.45m	0.6m	1.2m	3.0m	5.0m	10.0m
Resistance value	0.044Ω	0.051Ω	0.082Ω	0.172Ω	0.273Ω	0.530Ω
Weight	0.15kg	0.16kg	0.22kg	0.40kg	0.60kg	1.11kg

Connecting procedure

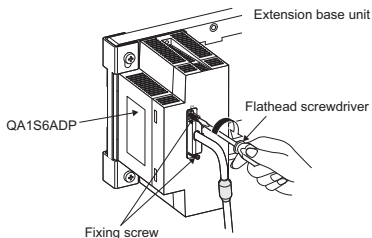
1. Remove the seal over the extension cable connector of the QA1S6ADP.



2. Hold the connector part of the cable, and insert it to the connector of the QA1S6ADP.



3. Fix the cable with the fixing screws (tightening torque: 0.20N·m).



Disconnecting procedure

To disconnect the extension cable, loosen and remove the fixing screws, and then disconnect the cable holding the connector part.

6 PRECAUTIONS FOR USING THE QA1S6ADP

6.1 Current Consumption of the QA1S6ADP

Voltage (5VDC) is supplied to the QA1S6ADP from the power supply module on the main base unit. Select the power supply module considering the current consumption of the QA1S6ADP. The current consumption of the power supply module on the main base unit will be as follows.

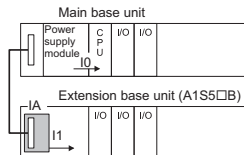
Calculation formula

Current consumption of the module(s) on the main base unit + Current consumption of the module(s) on the A1S5□B + Current consumption of the QA1S6ADP

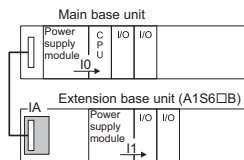
Calculation example

The current consumption calculation example is shown below.

- When the A1S5□B is used



- When the A1S6□B is used



Symbol	Description
I	Rated current of the power supply module on the main base unit
I ₀	Current consumption of the module(s) mounted on the main base unit
I ₁	Current consumption of the module(s) mounted on the extension base unit (In the system where the A1S6□B is used, the current consumption of the module(s) mounted on the extension base unit is supplied from the power supply module on the extension base unit.)
I _A	Current consumption of the QA1S6ADP

In the systems above, the QA1S6ADP can be used when the following condition is satisfied.

Calculation formula

$I > I_0 + I_1 + I_A$

6.2 Voltage Drops Across the QA1S6ADP and Extension Cable

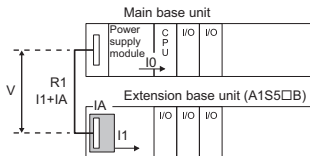
Voltage (5VDC) is supplied to the QA1S6ADP from the power supply module on the main base unit. Voltage drops occur across the QA1S6ADP and extension cable due to their resistance. If the specified voltage (4.75VDC or higher) is not supplied to the QA1S6ADP+A1S5□B/A1S6□B, incorrect input or output may be generated.

Since the output voltage of the power supply module on the main base unit is set to 4.90VDC (minimum), check that the sum of the voltage drops is 0.15V ($4.9V-4.75V=0.15V$) or lower.

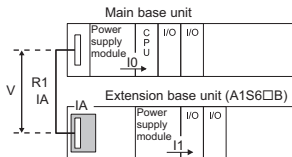
Calculation example

The voltage drop calculation example is shown below.

- When the A1S5□B is used



- When the A1S6□B is used



Item	Extension cable						Adapter
	QC05B	QC06B	QC12B	QC30B	QC50B	QC100B	QA1S6ADP
Resistance value	0.044Ω	0.051Ω	0.082Ω	0.172Ω	0.273Ω	0.530Ω	0.0158Ω

Symbol	Description
V	Sum of the voltage drops
R1	Resistance value of the extension cable between the main base unit and the extension base unit
RA	Resistance value of the QA1S6ADP
I1	Current consumption of the module(s) mounted on the extension base unit (In the system where the A1S6□B is used, the current consumption of the module(s) mounted on the extension base unit is supplied from the power supply module on the extension base unit.)
IA	Current consumption of the QA1S6ADP

In the systems above, the sum of the voltage drops will be as follows.

Extension base unit used	Voltage drops across the QA1S6ADP and extension cable
A1S5□B	$V=(R1+RA) \times (I1+IA)$
A1S6□B	$V=(R1+RA) \times IA$

Check that the condition ($0.15 > V$) is satisfied.

To connect the QA1S6ADP+A1S5□B, it is recommended to use the shortest extension cable possible so that the voltage drop is minimized.

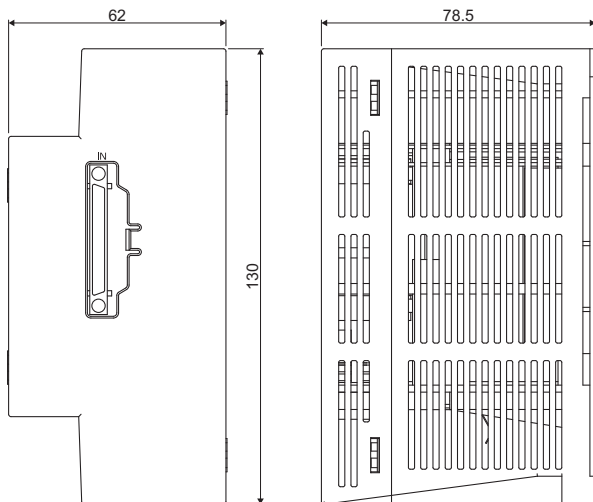
6.3 Precautions When Powering on the System

Supply power to the system where the QA1S6ADP is used in either of the following way.

- Simultaneously turn on the power supply modules on the main base unit and extension base unit.
- Turn on the power supply module on the main base unit first, and then turn on the power supply module on the extension base unit.

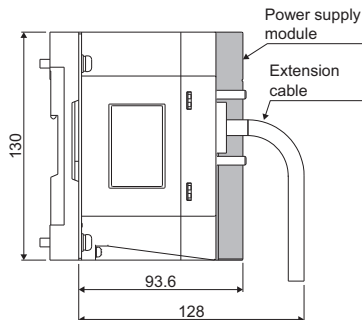
7 EXTERNAL DIMENSIONS

The external dimensions of the QA1S6ADP are shown below.



(Unit: mm)

When an extension cable is connected



(Unit: mm)

REVISIONS

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

Print date	*Manual number	Revision
April 2014	IB(NA)-0800538-A	First edition
December 2016	IB(NA)-0800538-B	Descriptions are revised due to compliance with the new China RoHS.
June 2018	IB(NA)-0800538-C	Descriptions are revised due to compliance with the Chinese standardized law.

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