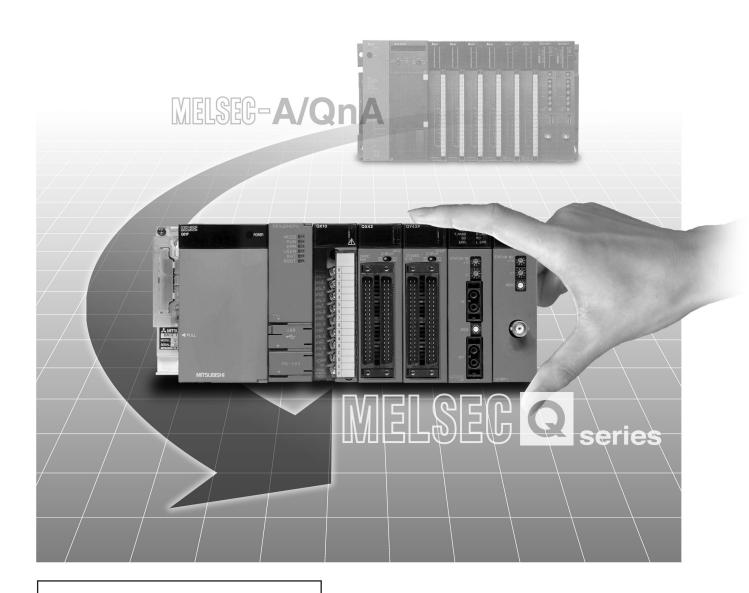




Mitsubishi Programmable Controller

Transition from MELSEC-A/QnA (Large Type) Series to Q Series Handbook

(Intelligent Function Modules)



May. 2015 Edition

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.

In this manual, the safety precautions are classified into two levels: "/NWARNING" and "/NCAUTION".

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.

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]

MARNING

- Configure safety circuits external to the programmable controller to ensure that the entire system
 operates safely even when a fault occurs in the external power supply or the programmable
 controller. Failure to do so may result in an accident due to an incorrect output or malfunction.
 - (1) Configure external safety circuits, such as an emergency stop circuit, protection circuit, and protective interlock circuit for forward/reverse operation or upper/lower limit positioning.
 - (2) When the programmable controller detects the following problems, it will stop calculation and turn off all output in the case of (a).In the case of (b), it will hold or turn off all output according to the parameter setting. Note that the AnS series module will turn off the output in either of cases (a) and (b).

	Q series module	A series module
(a) The power supply module has over current protection equipment and over voltage protection equipment.	Output OFF	Output OFF
(b) The CPU module self-diagnosis functions, such as the watchdog timer error, detect problems.	Hold or turn off all output according to the parameter setting.	Output OFF

Also, all outputs may be turned on if an error occurs in a part, such as an I/O control part, where the CPU module cannot detect any error. To ensure safety operation in such a case, provide a safety mechanism or a fail-safe circuit external to the programmable controller.

For a fail-safe circuit example, refer to LOADING AND INSTALLATION in the QCPU User's Manual (Hardware Design, Maintenance and Inspection).

(3) Outputs may remain on or off due to a failure of an output module relay or transistor. Configure an external circuit for monitoring output signals that could cause a serious accident.

[Design Precautions]

WARNING

- In an output module, when a load current exceeding the rated current or an overcurrent caused by a load short-circuit flows for a long time, it may cause smoke and fire. To prevent this, configure an external safety circuit, such as a fuse.
- Configure a circuit so that the programmable controller is turned on first and then the external power supply.

If the external power supply is turned on first, an accident may occur due to an incorrect output or malfunction.

• For the operating status of each station after a communication failure, refer to relevant manuals for each network.

Failure to do so may result in an accident due to an incorrect output or malfunction.

• When changing data of the running programmable controller from a peripheral connected to the CPU module or from a personal computer connected to an intelligent function module or special function module, configure an interlock circuit in the sequence program to ensure that the entire system will always operate safely.

For program modification and operating status change, read relevant manuals carefully and ensure the safety before operation.

Especially, when a remote programmable controller is controlled by an external device, immediate action cannot be taken if a problem occurs in the programmable controller due to a communication failure.

To prevent this, configure an interlock circuit in the sequence program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.

CAUTION

 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.

 When a device such as a lamp, heater, or solenoid valve is controlled through an output module, a large current (approximately ten times greater than normal) may flow when the output is turned from off to on.

Take measures such as replacing the module with one having a sufficient current rating.

After the CPU module is powered on or is reset, the time taken to enter the RUN status varies
depending on the system configuration, parameter settings, and/or program size. Design circuits so
that the entire system will always operate safely, regardless of the time.

[Installation Precautions]

!CAUTION

- Use the programmable controller in an environment that meets the general specifications in the QCPU User's Manual (Hardware Design, Maintenance and Inspection).
 - Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.
- To mount the module, while pressing the module mounting lever located in the lower part of the module, fully insert the module fixing projection(s) into the hole(s) in the base unit and press the module until it snaps into place.

Incorrect mounting may cause malfunction, failure or drop of the module.

When using the programmable controller in an environment of frequent vibrations, fix the module with a screw.

Tighten the screws within the specified torque range.

Undertightening can cause drop of the screw, short circuit, or malfunction.

Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.

 When using an extension cable, connect it to the extension cable connector of the base unit securely.

Check the connection for looseness.

Poor contact may cause incorrect input or output.

- When using a memory card, fully insert it into the memory card slot.
 - Check that it is inserted completely.

Poor contact may cause malfunction.

- Shut off the external power supply (all phases) used in the system before mounting or removing a module. Failure to do so may result in damage to the product. A module can be replaced online (while power is on) on any MELSECNET/H remote I/O station or in the system where a CPU module supporting the online module change function is used.
 - Note that there are restrictions on the modules that can be replaced online, and each module has its predetermined replacement procedure.
 - For details, refer to the relevant sections in the QCPU User's Manual (Hardware Design,
 - Maintenance and Inspection) and in the manual for the corresponding module.
- Do not directly touch any conductive part of the module.
 Doing so can cause malfunction or 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 damage to the product.
- After wiring, attach the included terminal cover to the module before turning it on for operation.
 Failure to do so may result in electric shock.

CAUTION

• Individually ground the FG and LG terminals of the programmable controller with a ground resistance of 100Ω or less.

Failure to do so may result in electric shock or malfunction.

- Use applicable solderless terminals and tighten them within the specified torque range.
 If any spade solderless terminal is used, it may be disconnected when the terminal screw comes loose, resulting in failure.
- 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 a fire or failure.

- Connectors for external devices must be crimped or pressed with the tool specified by the manufacturer, or must be correctly soldered.
 - Incomplete connections may cause short circuit, fire, or malfunction.
- Tighten the terminal screws within the specified torque range.
 - Undertightening can cause short circuit, fire, or malfunction.
 - Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- Prevent foreign matter such as dust or wire chips from entering the module.

 Such foreign matter can equal a fire failure, or malfunction.
 - Such foreign matter can cause a fire, failure, or malfunction.
- A protective film is attached to the top of the module to prevent foreign matter, such as wire chips, from entering the module during wiring.
 - Do not remove the film during wiring.
 - Remove it for heat dissipation before system operation.
- Mitsubishi programmable controllers must be installed in control panels.
 - Connect the main power supply to the power supply module in the control panel through a relay terminal block.
 - Wiring and replacement of a power supply module must be performed by qualified maintenance personnel with knowledge of protection against electric shock.
 - For wiring methods, refer to the QCPU User's Manual (Hardware Design, Maintenance and Inspection).

[Startup and Maintenance Precautions]

WARNING

- Do not touch any terminal while power is on. Doing so will cause electric shock.
- Correctly connect the battery connector.
 Do not charge, disassemble, heat, short-circuit, or solder the battery, or throw it into the fire.
 Doing so will cause the battery to produce heat, explode, or ignite, resulting in injury and fire.
- Shut off the external power supply (all phases) used in the system before cleaning the module or retightening the terminal screws or module fixing screws.

Failure to do so may result in electric shock.

Undertightening the terminal screws can cause short circuit or malfunction.

Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.

CAUTION

- Before performing online operations (especially, program modification, forced output, and operating status change) for the running CPU module from the peripheral device connected, read relevant manuals carefully and ensure the safety.
 Improper operation may damage machines or cause accidents.
- 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 in all directions from the programmable controller.
 Failure to do so may cause malfunction.
- Shut off the external power supply (all phases) used in the system before mounting or removing a module. Failure to do so may cause the module to fail or malfunction.
 - A module can be replaced online (while power is on) on any MELSECNET/H remote I/O station or in the system where a CPU module supporting the online module change function is used.
 - Note that there are restrictions on the modules that can be replaced online, and each module has its predetermined replacement procedure.
 - For details, refer to this manual and the online module change section in the manual of the module compatible with online module change.
- After the first use of the product, do not mount/remove the module to/from the base unit, and the terminal block to/from the module more than 50 times (IEC 61131-2 compliant) respectively.
 Exceeding the limit of 50 times may cause malfunction.
- Do not drop or apply shock to the battery to be installed in the module.
 Doing so may damage the battery, causing the battery fluid to leak inside the battery.
 If the battery is dropped or any shock is applied to it, dispose of it without using.
- Before handling the module, touch a conducting object such as a grounded metal to discharge the static electricity from the human body. Failure to do so may cause the module to fail or malfunction.

[Disposal Precautions]

CAUTION

When disposing of this product, treat it as industrial waste.
 When disposing of batteries, separate them from other wastes according to the local regulations.
 For details on battery regulations in EU member states, refer to the MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection).

[Transportation Precautions]

<u>^</u>CAUTION

When transporting lithium batteries, follow the transportation regulations.
 (Refer to QCPU User's Manual (Hardware Design, Maintenance and Inspection) for details of the controlled models.)

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.

MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT. ("Prohibited Application")

Prohibited Applications include, but not limited to, the use of the PRODUCT in;

- Nuclear Power Plants and any other power plants operated by Power companies, and/or any
 other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact the Mitsubishi representative in your region.

REVISIONS

* The handbook number is given on the bottom left of the back cover.

Print Date	* Handbook Number	Revision
Apr., 2005	L(NA)-08046ENG-A	First edition
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		Appendix 1
		Partial correction
		Contents, Appendix 1 → Appendix 2
Oct., 2008	L(NA)-08046ENG-C	Model addition
		Q64DAN, Q64RD-G, Q68RD3-G, Q68TD-G-H01
		Model change
		$QD62 \rightarrow QD62$ -H01, QD62-H02, Q62DA \rightarrow Q62DAN,
		Q68DAV → Q68DAVN, Q68DAI → Q68DAIN
		Partial correction
		Term revision (whole), SAFETY PRECAUTIONS, Chapter 3 (whole),
		Chapter 4 (whole), Section 6.1 to Section 6.3, Section 7.1, Section 9.1.2,
Int. 0044	L(NIA) 00040ENO D	Section 9.1.4, Appendix 2.1 to Appendix 2.3
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		Q68AD-G, Q68TD-G-H02
		Partial addition
		CONDITIONS OF USE FOR THE PRODUCT, Section 2.4, Section 2.6, Section 2.8
		Partial correction Torm revision (whole) SAFETY PRECAUTIONS Chapter 3 (whole)
		Term revision (whole), SAFETY PRECAUTIONS, Chapter 3 (whole), Chapter 4 (whole), Section 5.1.1, Section 5.2.1, Section 6.1, Section 6.2.1,
		Section 7.1, Section 7.4.1, Section 7.4.4, Section 7.5.1, Section 7.5.4,
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		Chapter 9 (External dimensions)
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		QD73A1
		Model change
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		Section 7.6
		Partial correction
		Section 2.4.4, Section 2.6.1, Section 2.8.1, Section 3.1, Section 4.6.1,
		Section 6.1, Section 6.3.4, Section 7.1, Section 7.2, Section 7.4

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Sep., 2014	L(NA)-08046ENG-G	Partial correction
		Section 2.1, Section 3.1, Section 4.1, Section 5.1, Section 6.1, Section 7.1,
		Section 7.2, Section 7.3, Section 7.5.5, Appendix 2.1
May, 2015	L(NA)-08046ENG-H	Addition
		Appendix 4
		Change
		Chapter 9 to Appendix 1, Appendix1 to Appendix 2, Appendix2 to Appendix 3
		Partial correction
		Section3.1, Section7.1, Section7.6.1, Section7.6.2

Japanese Handbook Version L-08045-I

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- For the products shown in handbooks for transition, catalogues, and transition examples, refer to the manuals for the relevant products and check the detailed specifications, precautions for use, and restrictions before replacement.
 - For the products manufactured by Mitsubishi Electric Engineering Co., Ltd., Mitsubishi Electric System & Service Co., Ltd., and other companies, refer to the catalogue for each product and check the detailed specifications, precautions for use, and restrictions before use.
 - The manuals and catalogues for our products, products manufactured by Mitsubishi Electric Engineering Co., Ltd., and Mitsubishi Electric System & Service Co., Ltd. are shown in Appendix of each handbook for transition.
- Products shown in this handbook are subject to change without notice.

INTRODUCTION

1.1 Advantages of Transition to Q Series

Advantage 1)Advanced performance of equipments

In addition to the processing performance improvement for Q series CPU, the processing speed for Q series intelligent function module is also increased, so that the equipment capability to improve is possible.

Advantage 2)Compact control panel and space saving

As the Q series needs only 1/4 mounting area of the A series, it is possible to create more compact control panel.

Advantage 3)Improved operating efficiency for programming and monitor

Q series intelligent function module prepares the following utility package (GX Configurator-o) sold separately.

(Example)

- GX Configurator-AD Analog input module setting/monitoring tool
- GX Configurator-DA Analog output module setting/monitoring tool
- GX Configurator-TI Temperature input module setting/monitoring tool
- GX Configurator-CT High speed counter module setting/monitoring tool
- GX Configurator-QP Positioning module setting/monitoring tool

Using the utility package is not a must. However, the utility package allows not only for the followings to do, but also reduces sequence programs.

- Initial setting is possible without a program
- The auto refresh setting allows to read/write buffer memory data of intelligent function module automatically from/to the CPU device memory.
- Checking of the setting status or operating status of intelligent function module is simplified.

1.2 Precautions for Transition from Large-sized A/QnA Series to Q Series

(1) Be sure to confirm its functions, specifications and instructions by referring the manual of the corresponding Q series module prior to use.

(2) Be sure to check the operation of whole system before the actual operation.

ANALOG INPUT MODULE REPLACEMENT

2.1 List of Analog Input Module Alternative Models for Replacement

Production discontinuation			Transition to Q series		
Product	Model	Model	Remarks (Restrictions)		
	A616AD	Q68ADV Q68ADI	1) External wiring : Cable size is changed. 2) Number of slots : Changed (2 modules are required.) 3) Program : Occupied I/O points, I/O signals and buffer memory address are changed. 4) Performance specifications change: 8CH/module, input signals (Either V or I input) 5) Function specifications: Not changed		
		Q68ADV Q68ADI	1) External wiring : Cable size is changed. 2) Number of slots : Not changed 3) Program : Occupied I/O points, I/O signals and buffer memory address are changed. 4) Performance specifications change:		
Analog input module	A68AD	Q68AD-G*1	1) External wiring : Cable size is changed. (Terminal block wiring → connector wiring) 2) Number of slots : Not changed 3) Program : Occupied I/O points, I/O signals and buffer memory address are changed. 4) Performance specifications change:		
	A68AD-S2	Q68ADV Q68ADI	1) External wiring : Cable size is changed. 2) Number of slots : Not changed 3) Program : Occupied I/O points, I/O signals and buffer memory address are changed. 4) Performance specifications change:		
		Q68AD-G*1	 4) Performance specifications change: Conversion speed ((the maximum of 2.5ms/channel) → sampling cycle (10ms/channel) + response speed (20ms)) and I/O characteristics 5) Function specifications: Changed (Non-insulation → insulation between channels) 		

Production discontinuation		Transition to Q series		
Product	Model	Model	Remarks (Restrictions)	
		Q68ADV Q68ADI	1) External wiring : Cable size is changed. 2) Number of slots : Not changed 3) Program : Occupied I/O points, I/O signals and buffer memory address are changed. 4) Performance specifications change:	
Analog input module	A68ADN	Q68AD-G*1	1) External wiring : Cable size is changed. (Terminal block wiring → connector wiring) 2) Number of slots : Not changed 3) Program : Occupied I/O points, I/O signals and buffer memory address are changed. 4) Performance specifications change:	

The Q68AD-G cannot be mounted on the Q series large type base unit (Q3 BL, Q6 BL, Q55BL).

⊠Point -

The existing wiring for the A/QnA series modules can be connected directly to the Q series modules using the upgrade tool (conversion adaptor) manufactured by Mitsubishi Electric Engineering Co., Ltd.

(1) One slot type (can be mounted on the Q series large type base unit)

Product	MELSEC-A/QnA series module	MELSEC-Q series module	Conversion adaptor
		Q68ADV	
	A68AD	Q68ADI	ERNT-AQT68AD
Analog input modulo	A68AD-S2	Q68ADV	
Analog input module	A00AD-32	Q68ADI	
	A68ADN	Q68ADV	ERNT-AQT68ADN
		Q68ADI	LINITAGIODADIN

(2) Two slot type

(cannot be mounted on the Q series large type base unit)

Product	series module		Conversion adaptor	
	A68AD	*4		
	A68AD-S2	Q64AD-GH (×2 modules)*1	ERNT-AQT68AD-GH	
Analog input module	A68ADN			
	A616AD (in voltage input)	Q68ADV (×2 modules)	ERNT-AQT616AD	
	A616AD (in current input)	Q68ADI (×2 modules)	LINTI AQ TOTOAD	

Replacement for the existing A series modules (large size) in the mixed use of voltage and current. For the single use of voltage or current, replacing with a conversion adapter of one slot type is possible.

For MELSEC-A/QnA (large type) Series to Q Series transition related products manufactured by Mitsubishi Electric Engineering Co., Ltd. or Mitsubishi Electric System & Service Co., Ltd., contact your local sales office or representative.

2.2 A616AD

2.2.1 Performance comparison

ŀ	tem				A616AD						
	Voltage		-10 to		Input resistance	value: 1MΩ)					
Analog input	Current	-20 to 0 to +20mADC (Input resistance value: 250Ω)									
Digital output				(-48 to 40	inary (Data part: 47, -2048 to 2047 bled for each cha	')					
I/O characteristics maximum resolution			Input Analog input range resolution output value Voltage (V)								
		When using A616AD -5V to 5V, -20 to 20m		\	10μA (1/4000) Range: ±0.3% (Digital value ±12	0 to 4000 -2000 to 2000					
Overall accura	acy	0 to 5V, 1 to 5V 0 to 20mA, 4 to 20m/ When using combina is ±0.3% (Digital outp	tion with any c	of A60MX, A60	Range: ±0.6% (Digital value ±24 MXR, A60MXRN		each range of A616AD				
			,								

O: Compatible, △: Partial change required, ×: Incompatible

Compatibility Precautions for replacement	ĺ		OCO A DV	,			OCOADI	0:0		tial change required, ×: Incompatible	
(Input resistance value: 1M£2) 0 to 20mADC (Input resistance value: 259Ω) A616AD can set the data format to [2048 to 2047]. However, 086ADVI cannot set.							Q68ADI		Compatibility	Precautions for replacement	
The part of the		(Input					-			The voltage/current cannot be	
A616AD can set the data format to [2048 to 2047]. However, QBADV/II cannot set. When using the conversion data of OG8ADV/I cannot set. When using the conversion data of OG8ADVI is cannot set. When using the conversion data of OG8ADVI is cannot set. When using the conversion data of OG8ADVI is cannot set. When using the conversion data of				,		0	to 20mADC	;	\triangle	-	
A616AD can set the data format to [2048 to 2047]. However, QBADV/II cannot set. When using the conversion data of OG8ADV/I cannot set. When using the conversion data of OG8ADVI is cannot set. When using the conversion data of OG8ADVI is cannot set. When using the conversion data of OG8ADVI is cannot set. When using the conversion data of			-								
Analog input range Digital output value Digital output value Resolution Output value Prosolution Output value Output va	(Normal resolution mod				ion mode: -	4096 to 409			Δ	format to [-2048 to 2047]. However, Q68ADV/I cannot set. When using the conversion data of Q68ADV/I in [-2048 to 2047], convert with	
Analog input range Digital output value Digital resolution Output value Prosolution Output value			1	Manager		1 .	P. L L. C.				
Voltage		Analog	input		1						
Voltage		rang	e	•			•				
Voltage			0 to 10\/	output value	-					When using A616AD in [-5 to +	
Voltage		-		0 to 4000	———		10000			5V] range, Q68ADV can obtain	
Voltage User range -10 to 10V User range -4000 to 4000 0.375mV -12000 to 12000 0.333mV -12000 t		-		0 10 4000	-	0 to	12000 —			equivalent resolution or more	
User range -4000 to 4000 0.375mV -12000 to 12000 0.33mV 0.33mV -12000 to 12000 0.33mV	Volta	age –			-		1. 10000			than A616AD by setting in [-10	
Settings		-		4000 to 4000	2.5MV	-16000	10 16000	0.625MV	_		
Current			_	-4000 to 4000	0.375m	-12000	to 12000	0.333mV			
Current 4 to 20mA User range Settings 4000 to 4000 1.37μA -12000 to 12000 1.33μA 1.33μA 1.33μA 1.33μA 1.33μA 1.33μA 1.33μA 1.33μA 1.33μA			0 to 20mA	0.1. 1000	5μA	0.1	40000	1.66µA		When using A616AD in [-20 to	
Voltage Current User range -4000 to 4000	0		4 to 20mA	0 to 4000	4µA	0 to	12000	1.33µA		+20mA] range, use Q68ADI in	
Analog input range Normal resolution mode High resolution mode Ambient temperature 0 to 55°C Ambient temperature drift	Cuir	ent	User range	4000 to 4000		40000	t- 40000	4.224			
Analog input range Ambient temperature 0 to 55°C With temperature drift compensation compensation Voltage Voltage Voltage O to 10V User range settings O to 20mA 4 to Current O to 55°C Without temperature drift compensation Ambient temperature temperature drift compensation Vision temperature drift compensation 10 to 10V -10 to 25±5°C			settings	-4000 10 4000	1.37μΑ	-12000	10 12000	1.35μΑ		3	
Analog input range Analog input range O to 55°C With temperature drift compensation Co			No	mal resolution m	ode	Hig	h resolution	mode			
Analog input range With temperature drift With temperature drift Compensation Compensati			Ambien	temperature		Ambient temperature					
range With out temperature drift compensation compensatio	Analo	a input		o 55°C	Ambient		55°C	Ambient			
Current Curr			With					temperature			
drift compensation compensation compensation O to 10V -10 to 10V -10 to 10V 1 to 5V User range settings 0 to 10V -20mA 4 to Current 20mA User range		J -	-			temperature	-	re '			
O to 10V											
-10 to 10V Voltage -10 to 10V Voltage -10 to 10V Voltage -10 to 10V Voltage -10 to 10V -10 to 10V -10 to 10 to -10		0 / 40	· ·	on compensation		compensation	compensat	ion			
Voltage 10V 10 to 5V 1 to 5V User range settings 10 to 20mA 4 to Current 20mA User range range range range range 10 to 20mA 10 t			-			±0.3%	±0.4%	±0.1%		A616AD is the accuracy in	
Voltage Voltag						(±48 digits)	(±64 digits	s) (±16 digits)		•	
Voltage 1 to 5V			,						_		
User range settings 0 to 20mA 4 to Current 20mA User range range ±0.3% ±0.4% ±0.1% (±4 digits) (±4 digits) ±0.3% ±0.4% ±0.4% ±0.1% (±36 digits) (±36 digits) (±48 digits) (±48 digits)	Voltage		_							_	
range settings 0 to 20mA 4 to Current User range range 2 mage 4 to 2 mage range 4 to Current 2 mage range 2 mage range 4 to Current 2 mage 2 mage 4 to Current 5 to Current 6 to Current 7 to Current 6 to Curre										·	
Settings ±0.3% ±0.1% (±16 digits) (±16 digits) ±0.3% ±0.3% ±0.4% ±0.1% (±36 digits) (±48 digits) (±12 digits) (±13 digits) (±14 digits) (±14 digits) (±15										output value.	
0 to 20mA			±0.3%	±0.4%	±0.1%						
20mA (±36 digits) (±48 digits) (±12 digits)			(±12 digits	(±16 digits)	(±4 digits)	+0.30/	±0 40/	+0 10/-			
Current 4 to 20mA User range											
Current 20mA			-			(±00 digits)	(±+0 digita	2, (±12 digita)			
User range	Current										
range	Current										
		_									
<u> </u>	 <u> </u>	Journal			<u> </u>						

When using only A616AD: 1 When using a combination with A60MX: 1 When using a combination with A60MXR: 1 (Sampling processing time), 7.0 (Direct access processing) When using a combination with A60MXRN: 1 (Sampling processing time), 7.0 (Direct access processing) When using a combination with A60MXRN: 1 (Sampling processing time), 7.0 (Direct access processing) [Unit: ms/channel] Voltage: ±15V Current: ±30mA Analog input points 16 channels/module
When using a combination with A60MX: 1 When using a combination with A60MXR: 1 (Sampling processing time), 7.0 (Direct access processing) When using a combination with A60MXRN: 1 (Sampling processing time), 7.0 (Direct access processing) [Unit: ms/channel] Voltage: ±15V Current: ±30mA Analog input points 16 channels/module
When using a combination with A60MXR: 1 (Sampling processing time), 7.0 (Direct access processing) When using a combination with A60MXRN: 1 (Sampling processing time), 7.0 (Direct access processing) [Unit: ms/channel] Voltage: ±15V Current: ±30mA Analog input points 16 channels/module
1 (Sampling processing time), 7.0 (Direct access processing) When using a combination with A60MXRN: 1 (Sampling processing time), 7.0 (Direct access processing) [Unit: ms/channel] Voltage: ±15V Current: ±30mA Analog input points 16 channels/module
Maximum conversion speed 7.0 (Direct access processing) When using a combination with A60MXRN: 1 (Sampling processing time), 7.0 (Direct access processing) [Unit: ms/channel] Voltage: ±15V Current: ±30mA Analog input points 16 channels/module
When using a combination with A60MXRN: 1 (Sampling processing time), 7.0 (Direct access processing) [Unit: ms/channel] Voltage: ±15V Current: ±30mA Analog input points 16 channels/module Maximum number of writes for E²PROM
1 (Sampling processing time), 7.0 (Direct access processing) [Unit: ms/channel] Voltage: ±15V Current: ±30mA Analog input points 16 channels/module Maximum number of writes for E²PROM
7.0 (Direct access processing) [Unit: ms/channel] Voltage: ±15V Current: ±30mA Analog input points 16 channels/module Maximum number of writes for E²PROM
[Unit: ms/channel] Voltage: ±15V Current: ±30mA Analog input points Maximum number of writes for E²PROM [Unit: ms/channel] Voltage: ±15V Current: ±30mA
Absolute maximum input Voltage: ±15V Current: ±30mA Analog input points 16 channels/module Maximum number of writes for E²PROM
Absolute maximum input Current: ±30mA Analog input points 16 channels/module Maximum number of writes for E²PROM
Analog input points 16 channels/module Maximum number of writes for E ² PROM
Maximum number of writes for E ² PROM
Maximum number of writes for E ² PROM
Maximum number of writes for E ² PROM
E ² PROM
Isolation method Between the input terminal and programmable controller: photocoupler isolation
Between channels: non-isolated (1M Ω resistor isolation)
Dielectric withstand voltage -
Insulation resistance -
32 points
Occupied I/O points (I/O assignment: special 32 points)
Connected terminal 38-point terminal block
·
Applicable wire size 0.75 to 2mm ²
(Applicable tightening torque: 39 to 59N•cm)
Applicable solderless V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A
terminal
Internal current consumption 1A
(5VDC)
Weight 0.85kg

O : Compatible, \triangle : Partial change required, \times : Incompatible

 OCSADV	OCSARI		2. Partial change required, *. Incompatible
Q68ADV	Q68ADI	Compatibility	Precautions for replacement
80μs/channel (When there is temperature adding 160μs will be used regardles	The state of the s	0	The conversion speed of Q68ADV/I to A616AD has become quick. And then, on Q68ADV/I, the noise that did not import on A616AD can be imported as analog signal. In this case, use the averaging processing function to remove the effect of noise.
±15V	±30mA	0	
8 channel	ls/module	Δ	Consider replacement with multiple Q68ADV/I.
Max. 100,	000 times	0	
Between the I/O terminal and prog photocoupl Between channe	er isolation	0	
Between the I/O terminal and prog 500VAC, for		0	
Between the I/O terminal and prog 500VDC, 20		0	
16 p (I/O assignment: in		Δ	I/O occupied points has changed to 16 points.
18-point ter	minal block	×	
0.3 to 0	×	Wiring change is required.	
R1.25-3 (A solderless terminal	with sleeve can not be used.)	×	
0.64A	0.64A	0	
 0.19kg	0.19kg	0	

2.2.2 Function comparison

 $\ensuremath{\mathsf{O}}$: With functions, -: Without functions

16	B	A 0.4.0.4.5	000 A B) 44	O: With functions, -: Without functions
Item	Description Openition which the A/D	A616AD	Q68ADV/I	Precautions for replacement
A/D conversion enable/ disable	Specifies whether to enable or disable the A/D conversion for each channel. By disabling the conversion for the channels that are not used, the sampling time can be shortened.	-	0	
Sampling processing	The A/D conversion for analog input values is performed successively for each channel, and the digital output value is output upon each conversion.	0	0	The sampling processing time changes depending on the number of channels used (number of channels set to A/D conversion enable) and whether, with or without the temperature drift compensation function. (a) Without temperature drift compensation function (processing time) = (number of channels used) × 80 (µs /1 channel) (b) With temperature drift compensation function (processing time) = (number of channels used) × 80 (µs /1 channel) +160µs
Direct access processing	Sequence program separately from normal sampling processing can specify channels to carry out the A/D conversion, and outputting the direct access request can perform direct A/D conversion of specified channels. When inputting channel specification with sampling processing and direct access processing simultaneously, the direct access request is prioritized.	0	-	Q68ADV/I does not have [Direct access processing] function.
Averaging processing	For each channel, A/D conversion values are averaged for the set number of times or set amount of time, and the average value is output as a digital value. The setting range is as shown below: Averaging processing by the number of times: 4 to 62500 Averaging processing by time: 2 to 5000ms	-	0	
Maximum and minimum values hold function	The maximum and minimum values of the digital output values are retained in the module.	-	0	
Temperature drift compensation function	Errors arising from changes in the ambient temperature of the module are automatically compensated to improve conversion accuracy. The temperature drift compensation function can be performed at (A/D conversion time for all channels) + 160µs.	-	0	
Resolution mode	The resolution settings of 1/4000, 1/12000 or 1/16000 can be selected according to the application. The resolution mode setting is applicable to all channels.	-	0	
Online module change	A module change is made without the system being stopped.	-	0	The CPUs corresponding to online module replacement are process CPU and redundant CPU modules.

2.2.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals or sequence program, refer to the Analog-Digital Converter Module User's Manual.

	A61	6AD		Q68ADV/I				
Device	Signal name	Device	Signal name	Device	Signal name	Device	Signal name	
No.		No.	Signal name	No.	Signal name	No.	Signal hame	
X0	Watchdog timer error	Y0		X0	Module READY	Y0		
X1	A/D conversion READY	Y1		X1	Temperature drift	Y1		
					compensation flag			
X2	Error flag	Y2		X2		Y2		
X3 X4		Y3 Y4		X3 X4		Y3 Y4	Not used	
X5		Y5		X5	Not used	Y5	Not used	
X6		Y6		X6		Y6		
X7		Y7		X7		Y7		
X8		Y8	Not used	X8	High resolution mode status flag	Y8		
X9		Y9		X9	Operating condition setting completed flag	Y9	Operating condition setting request	
XA		YA		XA	Offset/gain setting mode flag	YA	User range write request	
ХВ		YB		XB	Channel change completed flag	YB	Channel change request	
XC		YC		XC	Not used	YC	Not used	
					Maximum value/		Maximum value/	
XD		YD	RFRP, RTOP instruction	XD	minimum value reset	YD	minimum value reset	
	Not used		for interlock signal when		completed flag		request	
XE		YE	A616AD is used in remote I/O station	XE	A/D conversion completed flag	YE	Not used	
XF		YF		XF	Error flag	YF	Error clear request	
X10		Y10						
X11		Y11						
X12 X13		Y12 Y13						
X13		Y14	Not used					
X15		Y15						
X16		Y16						
X17		Y17						
X18		Y18	Direct access request signal					
X19		Y19		1				
X1A		Y1A						
X1B		Y1B						
X1C		Y1C	Not used					
X1D	RFRP, RTOP instruction	Y1D						
X1E	for interlock signal when	Y1E						
X1F	A616AD is used in	Y1F						
	remote I/O station							

2.2.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs. For details of the buffer memory or sequence program, refer to the Analog-Digital Converter Module User's Manual.

		A616AD			Q68ADV/I		
Address (Dec.)		Name	Read/write	Address (Dec.)	Name	Read/write	
0		INPUT designation		0	A/D conversion enable/disable		
1	For direct	MX. CH. designation	R/W	1	CH1 Time/count averaging setting	1	
2	access	Digital output value	R	2	CH2 Time/count averaging setting		
3	Sampling perio			3	CH3 Time/count averaging setting		
4	Data format selection			4	CH4 Time/count averaging setting	1	
5	Error code storage		R/W	5	CH5 Time/count averaging setting	R/W	
6	Faulty multiplexer module CNT. No. storage		1	6	CH6 Time/count averaging setting	1	
7	<u> </u>			7	CH7 Time/count averaging setting	1	
8				8	CH8 Time/count averaging setting	1	
9				9	Averaging processing specification	1	
10	1			10	A/D conversion completed flag		
11	System area (N	lot used)	-	11	CH1 Digital output value	1	
12				12	CH2 Digital output value	1	
13				13	CH3 Digital output value	1	
14			14	CH4 Digital output value	1		
15		A616AD		15	CH5 Digital output value	1 _	
16		INPUT 0 A60MX, A60MXR	1	16	CH6 Digital output value	R	
17		INPUT 1 A60MX, A60MXR	1	17	CH7 Digital output value	1	
18	Conversion	INPUT 2 A60MX, A60MXR		18	CH8 Digital output value	1	
19	enable/disable	INPUT 3 A60MX, A60MXR		19	Error code	1	
20	designation	INPUT 4 A60MX, A60MXR	R/W	20	Setting range (CH1 to CH4)		
21	1 ~	INPUT 5 A60MX, A60MXR		21	Setting range (CH5 to CH8)		
22		INPUT 6 A60MX, A60MXR		22	Offset/gain setting mode Offset specification		
23		INPUT 7 A60MX, A60MXR	1	23	Offset/gain setting mode Gain specification	R/W	
24	Set data setting	request	1	24			
25	`	<u> </u>		25			
26				26			
27				27	System area (Not used)	-	
28				28			
29				29			
30				30	CH1 Maximum value		
31				31	CH1 Minimum value	1	
32	-			32	CH2 Maximum value		
33	1			33	CH2 Minimum value	1	
34	1			34	CH3 Maximum value	1	
35	System area (N	lot used)	-	35	CH3 Minimum value	1	
36	1	•		36	CH4 Maximum value	1	
37	1			37	CH4 Minimum value	1 _	
38	1			38	CH5 Maximum value	R	
39	1			39	CH5 Minimum value	1	
40	1			40	CH6 Maximum value	1	
41	1			41	CH6 Minimum value	1	
42	1			42	CH7 Maximum value	1	
43	1			43	CH7 Minimum value	1	
44	1			44	CH8 Maximum value	1	
45	1			45	CH8 Minimum value	1	

	A616AD			Q68ADV/I			
Address	Nama	Decelhorite	Address	Nama	Nome Bookhurita		
(Dec.)	Name	Read/write	(Dec.)	Name	Read/write		
46	Custom area (Not used)		46				
47	System area (Not used)	-	47]			
48			48]			
to	INPUT channel digital output value	R	to	System area (Net year)			
63			63	System area (Not used)	-		
64			64				
to			to				
157			157				
158			158	Mode switching setting	R/W		
159			159	Wide Switching Setting	10,00		
160			160				
to			to	System area (Not used)	-		
201			201				
202			202	CH1 Industrial shipment settings offset value	·		
203			203	CH1 Industrial shipment settings gain value			
204			204	CH2 Industrial shipment settings offset value	!		
205			205	CH2 Industrial shipment settings gain value	_		
206			206	CH3 Industrial shipment settings offset value	! <u> </u>		
207			207	CH3 Industrial shipment settings gain value	_		
208			208	CH4 Industrial shipment settings offset value	! <u> </u>		
209			209	CH4 Industrial shipment settings gain value			
210			210	CH5 Industrial shipment settings offset value	<u>!</u>		
211			211	CH5 Industrial shipment settings gain value	_		
212			212	CH6 Industrial shipment settings offset value	<u> </u>		
213			213	CH6 Industrial shipment settings gain value	_		
214 215	Custom area (Not used)		214 215	CH7 Industrial shipment settings offset value	<u>!</u>		
216	System area (Not used)	-	216	CH2 Industrial shipment settings gain value			
217			217	CH8 Industrial shipment settings offset value CH8 Industrial shipment settings gain value	1		
218			218	CH1 User range settings offset value	R/W		
219			219	CH1 User range settings gain value			
220			220	CH2 User range settings offset value			
221			221	CH2 User range settings gain value	_		
222			222	CH3 User range settings offset value			
223			223	CH3 User range settings gain value	_		
224			224	CH4 User range settings offset value	_		
225			225	CH4 User range settings gain value	_		
226			226	CH5 User range settings offset value			
227			227	CH5 User range settings gain value			
228			228	CH6 User range settings offset value			
229			229	CH6 User range settings gain value	_		
230			230	CH7 User range settings offset value	_		
231			231	CH7 User range settings gain value			
232			232	CH8 User range settings offset value			
233			233	CH8 User range settings gain value			
234					•		
to							
255							
256		-					
to	MX. CH. channel digital output value	R					
383							

2.3 A68AD (Upgrade to Q68ADV, Q68ADI)

2.3.1 Performance comparison

It	tem	A68AD								
	Voltage	-10 to 0 to +10VDC								
Analog input	Tollago	(Input resistance value: Hardware version K or later: 1MΩ, Hardware version J or earlier: 30kΩ)								
3 3 1	Current	+4 to +20mADC (Input resistance value: 250Ω)								
		*Usable current input: -20 to 0 to +20mA								
Digital output		16-bit signed binary (-2048 to +2047)								
		Analog input Digital output								
		+10V +2000								
I/O characteris	stics	+5V or +20mA +1000								
0 0		0V or +4mA ±0								
		-5V or -12mA -1000								
		-10V -2000								
		Valle va. Feb.V (4/2000)								
Maximum reso	olution	Voltage: 5mV (1/2000)								
		Current: 20µA (1/1000)								
	cy (Accuracy in	±1% (±20)								
respect to max	kimum digital									
output value)										
Maximum con	version speed	Max. 2.5ms/channel								
	этогог оросс									
		Vallaga: ±15V								
Absolute maxi	mum input	Voltage: ±15V current: ±30mA								
		Current. ISOTHA	1							

O : Compatible, △ : Partial change required, ×: Incompatible

	Q68AE)V			Q68ADI				tial change required, ×: Incompatible Precautions for replacement
	-10 to 10								
(Inpu	it resistance			- 					The voltage/current cannot be
				0	to 20mAD	C		Δ	mixed for one module.
				(Input resis	stance val	lue: 250Ω)			
		16-bi	t signed bin	nary					
		(Normal resolut						0	
	High res	solution mode: -1	2288 to 12	287, -16384	to 16383)			
Analog	g input	Normal reso	lution mode	I	High resolu	tion mode			As concept of gain value is
	ige	Digital	Maximu		gital	Maximum			changed, refer to [Analog-
0 to 10V		output value	resolutio		it value	resolution		Δ	Digital Converter Module
	0 to 10V	0 to 4000	2.5mV 1.25mV		16000	0.625mV 0.416mV			User's Manual] and then,
	1 to 5V	0 10 4000	1.0mV	0 to	12000	0.333mV			confirm the I/O characteristics.
Voltage	-10 to 10V		2.5mV		to 16000	0.625mV			
-	User range	-4000 to 4000	0.275m)	12000	to 12000	0.222m\/	 		-
	settings		0.375m\	v -12000	to 12000	0.333mV			
	0 to 20mA	0 to 4000	5µA	0 to	12000	1.66µA		_	
Current	4 to 20mA		4µA			1.33µA		0	
	User range settings	-4000 to 4000	1.37µA	-12000	to 12000	1.33µA			
	30111193				1				
	N	ormal resolution m	ode	Hiç	gh resolutio	n mode			
	Ambient	temperature 0 to		Ambient temperature 0 to					
Analog inpu	ıt	55°C			55°C	Ambient	ent		
range	With	Without ure temperature	temperature	With temperature	Witho	nerature			
	drift	drift	25±5°C	drift	drift	25+5	°C		
	compensa	tion compensation		compensatio	n compens	ation			
0 to 1				±0.3%	±0.4%	% ±0.19	%		
-10				(±48 digits)	(±64 dig				
10\ 0 to 9									
Voltage 1 to								0	
usei									
rang		±0.4%	±0.1%						
settin	gs (±12 digit		(±4 digits)						
0 to		(1 3 1)	(1317)	±0.3%	±0.49				
20m				(±36 digits)	(±48 dig	gits) (±12 di	igits)		
Current 20m									
usei									
rang									
settin	igs								
									The conversion speed of
									Q68ADV/I to A68AD has
									become quick. And then, on
		80)µs/channe	I					A68AD, the noise that did not
(When there	is temperati	re drift compens	•		ed by add	ina 160 us v	will be	0	import on Q68ADV/I can be
(Whom and/o		d regardless of the			-	mg roo po r		O	imported as analog signal. In
	4000	0 3 4 1 4 10 00 01 11							this case, use the averaging
									processing function to remove
									the effect of noise.
									and direct of fields.
	±15V	•			±30mA			0	
ı									

Item	A68AD	
Analog input points	8 channels/module	
Maximum number of writes for		
E ² PROM	-	
Isolation method	Between the input terminal and programmable controller power supply: photocoupler isolation Between channels: non-isolated	
Dielectric withstand voltage	-	
Insulation resistance	-	
Occupied I/O points	32 points (I/O assignment: special 32 points)	
Connected terminal	38-point terminal block	
Applicable wire size	0.75 to 2mm ² (Applicable tightening torque: 39 to 59N•cm)	
Applicable solderless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	
Internal current consumption	Hardware version K or later: 0.39A	
(5VDC)	Hardware version J or earlier: 0.9A	
Weight	Hardware version K or later: 0.3kg	
	Hardware version J or earlier: 0.6kg	

O: Compatible, \triangle : Partial change required, \times : Incompatible

Q68ADV	Q68ADI	Compatibility	Precautions for replacement	
8 channe	ls/module	0		
Max. 100,	000 times	0		
photocoup	rammable controller power supply: ler isolation els: non-isolated	0		
Between the I/O terminal and programmable controller power supply: 500VAC, for 1 minute		0		
	rammable controller power supply: MΩ or more	0		
•	oints ntelligent 16 points)	Δ	I/O occupied points has changed to 16 points.	
18-point terminal block		×		
0.3 to 0	.75mm ²	×	Wiring change is required.	
R1.25-3 (A solderless termina	I with sleeve can not be used.)	×		
0.64A	0.64A	Δ	The recalculation of internal current consumption [5VDC] is required.	
0.19kg	0.19kg	0		

2.3.2 Function comparison

 $\ensuremath{\mathsf{O}}$: With functions, -: Without functions

Item	Description	A68AD	Q68ADV/I	Precautions for replacement
A/D conversion enable/disable	Specifies whether to enable or disable the A/D conversion for each channel. By disabling the conversion for the channels that are not used, the sampling time can be shortened.	0	0	
Sampling processing	The A/D conversion for analog input values is performed successively for each channel, and the digital output value is output upon each conversion.	0	Ο	The sampling processing time changes depending on the number of channels used (number of channels set to A/D conversion enable) and whether, with or without the temperature drift compensation function. (a) Without temperature drift compensation function (processing time) = (number of channels used) × 80 (µs /1 channel) (b) With temperature drift compensation function (processing time) = (number of channels used) × 80 (µs /1 channel) + 160µs
Averaging processing	For each channel, A/D conversion values are averaged for the set number of times or set amount of time, and the average value is output as a digital value.	0	0	The setting range of average time and count differ. Refer to [Analog-Digital Converter Module User's Manual] and then, confirm the specifications.
Maximum and minimum values hold function	The maximum and minimum values of the digital output values are retained in the module.	-	0	
Temperature drift compensation function	Errors arising from changes in the ambient temperature of the module are automatically compensated for to improve conversion accuracy. The temperature drift compensation function can be performed at (A/D conversion time for all channels) + 160µs.	-	0	
Resolution mode	The resolution settings of 1/4000, 1/12000 or 1/16000 can be selected according to the application. The resolution mode setting is applicable to all channels.	-	0	
Online module change	A module change is made without the system being stopped.	-	0	Replaceable modules during online are a process CPU and a redundant CPU.

2.3.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals or sequence program, refer to the Analog-Digital Converter Module User's Manual.

A68AD			Q68ADV/I				
Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	Device No.	Signal name
X0	Watchdog timer error	Y0		X0	Module READY	Y0	
X1	A/D conversion READY	Y1		X1	Temperature drift compensation flag	Y1	
X2		Y2		X2		Y2	
X3		Y3		Х3		Y3	
X4		Y4		X4	Not used	Y4	Not used
X5		Y5		X5		Y5	
X6		Y6		X6		Y6	
X7 X8		Y7 Y8		X7 X8	High resolution mode	Y7 Y8	
X9		Y9		X9	status flag Operating condition setting completed flag	Y9	Operating condition setting request
XA		YA		XA	Offset/gain setting mode flag	YA	User range write request
ХВ		YB		ХВ	Channel change completed flag	YB	Channel change request
XC		YC		XC	Not used	YC	Not used
XD		YD	Not used	XD	Maximum value/ minimum value reset	YD	Maximum value/ minimum value reset
XE	Not used	YE		XE	completed flag A/D conversion completed flag	YE	request Not used
XF		YF		XF	Error flag	YF	Error clear request
X10		Y10					
X11 X12		Y11 Y12					
X13		Y13					
X14		Y14					
X15		Y15					
X16		Y16					
X17		Y17					
X18		Y18					
X19		Y19					
X1A		Y1A					
X1B		Y1B					
X1C X1D		Y1C Y1D					
X1D X1E		Y1E					
X1F		Y1F					

2.3.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs. For details of the buffer memory or sequence program, refer to the Analog-Digital Converter Module User's Manual.

A68AD			Q68ADV/I				
Address		Bo callit	Address				
(Dec.)	Name	Read/write	(Dec.)	Name	Read/write		
0	Number of channels		0	A/D conversion enable/disable			
1	Averaging processing specification		1	CH1 Time/count averaging setting	1		
2	CH1 Averaging time, count		2	CH2 Time/count averaging setting	1		
3	CH2 Averaging time, count		3	CH3 Time/count averaging setting	1		
4	CH3 Averaging time, count	DAM	4	CH4 Time/count averaging setting	DAM		
5	CH4 Averaging time, count	R/W	5	CH5 Time/count averaging setting	R/W		
6	CH5 Averaging time, count		6	CH6 Time/count averaging setting	1		
7	CH6 Averaging time, count		7	CH7 Time/count averaging setting			
8	CH7 Averaging time, count		8	CH8 Time/count averaging setting	1		
9	CH8 Averaging time, count		9	Averaging processing specification			
10	CH1 Digital output value		10	A/D conversion completed flag			
11	CH2 Digital output value		11	CH1 Digital output value	1		
12	CH3 Digital output value		12	CH2 Digital output value	1		
13	CH4 Digital output value		13	CH3 Digital output value			
14	CH5 Digital output value	R	14	CH4 Digital output value			
15	CH6 Digital output value		15	CH5 Digital output value			
16	CH7 Digital output value		16	CH6 Digital output value	R		
17	CH8 Digital output value		17	CH7 Digital output value			
18			18	CH8 Digital output value			
19			19	Error code			
20			20	Setting range (CH1 to CH4)			
21			21	Setting range (CH5 to CH8)			
22			22	Offset/gain setting mode Offset specification	5.44		
23				Offset/gain setting mode Gain specification	R/W		
24			24				
25	1		- 25 26 20 41 4 4 1		-		
26	System area (Not used)	-		1			
27			27	System area (Not used)			
28			28				
29			29				
30			30	CH1 Maximum value			
31			31	CH1 Minimum value			
32			32	CH2 Maximum value			
33			33	CH2 Minimum value			
34	Write data error code	R/W	34	CH3 Maximum value			
		<u> </u>	35	CH3 Minimum value			
			36	CH4 Maximum value			
			37	CH4 Minimum value	1 _		
			38	CH5 Maximum value	R		
			39	CH5 Minimum value	1		
			40	CH6 Maximum value	1		
			41	CH6 Minimum value	1		
			42	CH7 Maximum value	1		
			43	CH7 Minimum value	1		
			44	CH8 Maximum value	1		
				•	1		

	Q68ADV/I	
Address	Name	Decalemite
(Dec.)	Name	Read/write
46		
to	System area (Not used)	-
157		
158	Made quitables action	DAM
159	Mode switching setting	R/W
160		
to	System area (Not used)	-
201		
202	CH1 Industrial shipment settings offset value	
203	CH1 Industrial shipment settings gain value	
204	CH2 Industrial shipment settings offset value	
205	CH2 Industrial shipment settings gain value	
206	CH3 Industrial shipment settings offset value	
207	CH3 Industrial shipment settings gain value	
208	CH4 Industrial shipment settings offset value	
209	CH4 Industrial shipment settings gain value	
210	CH5 Industrial shipment settings offset value	
211	CH5 Industrial shipment settings gain value	
212	CH6 Industrial shipment settings offset value	
213	CH6 Industrial shipment settings gain value	
214	CH7 Industrial shipment settings offset value	
215	CH7 Industrial shipment settings gain value	
216	CH8 Industrial shipment settings offset value	
217	CH8 Industrial shipment settings gain value	D 0.47
218	CH1 User range settings offset value	R/W
219	CH1 User range settings gain value	
220	CH2 User range settings offset value	
221	CH2 User range settings gain value	
222	CH3 User range settings offset value	
223	CH3 User range settings gain value	
224	CH4 User range settings offset value	
225	CH4 User range settings gain value	
226	CH5 User range settings offset value	
227	CH5 User range settings gain value	
228	CH6 User range settings offset value	
229	CH6 User range settings gain value	
230	CH7 User range settings offset value	
231	CH7 User range settings gain value	
232	CH8 User range settings offset value	
233	CH8 User range settings gain value	

2.4 A68AD (Upgrade to Q68AD-G)

2.4.1 Performance comparison

It	tem		A68	BAD						
	Voltage	-10 to 0 to +10VDC (Input resistance value: Hardware version K or later: $1M\Omega$, Hardware version J or earlier: $30k\Omega$)								
Analog input	Current	+4 t	+4 to +20mADC (Input resistance value: 250Ω) *Usable current input: -20 to 0 to +20mA							
Digital output			16-bit signed binar	y (-2048 to +2047)					
I/O characteristics			Analog input +10V +5V or +20mA 0V or +4mA -5V or -12mA -10V	Digital output +2000 +1000 ±0 -1000 -2000						
Maximum reso	blution		Voltage: 5n Current: 20	nV (1/2000) µA (1/1000)						
Overall accura respect to max output value)	icy (Accuracy in kimum digital		±1%	(±20)						
Maximum conv	Maximum conversion speed Max. 2.5ms/channel									
Response time	9	-								
Absolute maxii	voltage: ±15V current: ±30mA									

O: Compatible, △: Partial change required, ×: Incompatible

					O .	Compatible, — . i ai	tiai change required, meempatible
		Q	68AD-G			Compatibility	Precautions for replacement
		-10					
		(Input resistance					
		0 to	0				
		(Input resista					
		16-bit s					
	1)	Normal resolutio	n mode: -4096	to 4095,		0	
	High resol	lution mode: -12	288 to 12287,	-16384 to 16383))		
				·			
		Normal reso	lution mode	High resolu	ition mode		
Input	Analog input range	Digital	Maximum	Digital	Maximum		
		output value	resolution	output value	resolution		
	0 to 10V		2.5mV	0 to 16000	0.625mV		
	0 to 5V	0 to 4000	1.25mV	0 to 12000	0.416mV		
	1 to 5V		1.0mV	0 to 12000	0.333mV		As concept of gain value is
Voltage	1 to 5V (Expanded mode)	-1000 to 4500	1.0mV	-3000 to 13500	0.333mV	Δ	changed, refer to Q68AD-G [User's Manual] and then,
	-10 to 10V	-4000 to 4000	2.5mV	-16000 to 16000	0.625mV		confirm the I/O characteristics.
	Users range setting	-4000 10 4000	0.375mV	-12000 to 12000	0.333mV		Committee i/O characteristics.
	0 to 20mA	0 to 4000	5μΑ	0 to 12000	1.66µA		
	4 to 20mA	0 10 4000	4µA	0 10 12000	1.33µA		
Current	4 to 20mA (Expanded mode)	-1000 to 4500	4μΑ	-3000 to 13500	1.33μΑ		
	Users range setting	-4000 to 4000	1.37µA	-12000 to 12000	1.33µA		
			. 0. 10/				
			±0.1%				
			ution mode: ±4	•			
		solution mode (0		, -		0	
		tion mode (Othe					
	Tempera	ature coefficient					
		10m		The conversion speed of			
		(Sam		Q68AD-G to A68AD has			
			Δ	become slow. If fast			
	20ms						conversion speed is required
			201110				for control, the Q64AD is
							recommended.
		Volta	age: ±15V			0	
		curre	ent: ±30mA				

Item	A68AD	
Analog input points	8 channels/module	
Maximum number of writes for		
E ² PROM	-	
Isolation method	Between the input terminal and programmable controller power supply: photocoupler isolation Between channels: non-isolated	
Dielectric withstand voltage	-	
Insulation resistance	-	
Occupied I/O points	32 points (I/O assignment: special 32 points)	
Connected terminal	38-point terminal block	
Applicable wire size	0.75 to 2mm ² (Applicable tightening torque: 39 to 59N•cm)	
Applicable solderless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	
Internal current consumption (5VDC)	Hardware version K or later: 0.39A Hardware version J or earlier: 0.9A	
Weight	Hardware version K or later: 0.3kg Hardware version J or earlier: 0.6kg	

Q68AD-G	Compatibility	Precautions for replacement
8 channels/module	0	
Up to 50,000 times	0	
Between the I/O terminal and programmable controller power supply:		
transformer isolation	0	
Between channels: transformer isolation		
Between the I/O terminal and programmable controller power supply:		
500VACrms, for 1 minute	0	
Between analog input channels: 1000VACrms, for 1 minute		
Between the I/O terminal and programmable controller power supply:		
500VDC, $10M\Omega$ or more	0	
Between analog input channels: 500VDC, $10M\Omega$ or more		
16 points		I/O occupied points has
(I/O assignment: intelligent 16 points)	Δ	changed to 16 points.
40-pin connector	×	
Within 0.3mm ²	×	Wiring change is required.
-	×	
0.46A	Δ	The recalculation of internal current consumption [5VDC] is required.
0.16kg	0	

2.4.2 Function comparison

 $\ensuremath{\mathsf{O}}$: With functions, -: Without functions

Item	Description	A68AD	Q68AD-G	Precautions for replacement
	Specifies whether to enable or disable the			
	A/D conversion for each channel.			
A/D conversion enable/disable	By disabling the conversion for the	0	0	
	channels that are not used, the sampling			
	time can be shortened.			
	The A/D conversion for analog input values			
	is performed successively for each channel,			
Sampling processing	and the digital output value is output upon	0	0	
	each conversion.			
	For each channel, A/D conversion values			
	are averaged for the set number of times or	_	_	The setting range of average
	set amount of time, and the average value	0	0	time and count differ.
Averaging processing	is output as a digital value.			Refer to Q68AD-G [User's
	Moving average takes the average of the			Manual] and then, confirm the
	specified number of digital output values	-	0	specifications.
	measured per sampling time.			
	A digital output value is smoothed		_	
Primary delay filter	according to the preset time constant.	-	0	
	The maximum and minimum values of the			
Maximum and minimum values	digital output values are retained in the	-	0	
hold function	module.			
	The resolution can be switched according to			
Resolution mode	the application. The resolution mode is	-	0	
	batch-set for all the channels.*1			
Input signal error detection	The voltage/current outside the setting		_	
function	range is detected.	-	0	
	(1) Process alarm			
	A warning is output if a digital output			
	value falls outside the setting range.			
Warning output function	(2) Rate alarm	-	0	
	A warning is output if the varying rate of			
	a digital output value falls outside the			
	preset varying rate range.			
	Conversion of A/D conversion values to			
	preset percentage values and loading into			
Scaling function	the buffer memory is available.	-	0	
	Programming steps for the scaling can be			
	eliminated.			
	A modulo change is made without the			Replaceable modules during
Online module change	A module change is made without the	-	0	online are a process CPU and a
	system being stopped.			redundant CPU.

For the A68AD, the resolution for voltage is 1/2000 and that for current is 1/1000 (fixed). For the Q68AD-G, the resolution for voltage and current is 1/4000 in the normal resolution mode, while the resolution for the voltage from -10 to 10V is 1/16000 and the resolution for the voltage in other ranges and current is 1/12000 in the high resolution mode.

2.4.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals or sequence program, refer to the Channel Isolated Analog-Digital Converter Module, Channel Isolated Analog-Digital Converter Module (With Signal Conditioning Function) User's Manual.

A68AD				Q68AD-G			
Device	Signal name	Device	Signal name	Device	Signal name	Device	Signal name
No.	Signal name	No.	Signal name	No.	Signal name	No.	Signal name
X0	Watchdog timer error	Y0		X0	Module READY	Y0	
X1	A/D conversion READY	Y1		X1		Y1	
X2		Y2		X2		Y2	
Х3		Y3		Х3	Not used	Y3	
X4		Y4		X4		Y4	Not used
X5		Y5		X5		Y5	
X6		Y6		X6		Y6	
X7		Y7		X7	High resolution mode status flag	Y7	
X8		Y8		X8	Warming output signal	Y8	
X9		Y9		X9	Operating condition setting completed flag	Y9	Operating condition setting request
XA		YA		XA	Offset/gain setting mode flag	YA	User range write request
ХВ		YB		XB	Channel change completed flag	YB	Channel change request
XC		YC		XC	Input signal error detection signal	YC	Not used
					Maximum value/		Maximum value/
XD		YD	Not used	XD	minimum value reset	YD	minimum value reset
	Not used		- Not useu		completed flag		request
XE		YE		XE	A/D conversion completed flag	YE	Not used
XF		YF		XF	Error flag	YF	Error clear request
X10		Y10					
X11		Y11					
X12		Y12					
X13		Y13					
X14		Y14					
X15		Y15 Y16					
X16 X17		Y17					
X17 X18		Y18					
X19		Y19					
X1A		Y1A					
X1B		Y1B					
X1C		Y1C					
X1D		Y1D					
X1E		Y1E					
X1F		Y1F					

2.4.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs. For details of the buffer memory or sequence program, refer to the Channel Isolated Analog-Digital Converter Module, Channel Isolated Analog-Digital Converter Module (With Signal Conditioning Function) User's Manual.

	A68AD			Q68AD-G		
Address (Dec.)	Name	Read/write	Address (Dec.)	Name	Read/write	
0	Number of channels		0	A/D conversion enable/disable		
1	Averaging processing energification		1	CH1 Average time/Average number of times/	1	
1	Averaging processing specification		1	Moving average/Time constant settings		
2	CH1 Averaging time, count		2	CH2 Average time/Average number of times/		
2	CH1 Averaging time, count		2	Moving average/Time constant settings		
3	CH2 Averaging time, count		3	CH3 Average time/Average number of times/		
3	Criz Averaging time, count		3	Moving average/Time constant settings		
4	CH3 Averaging time, count		4	CH4 Average time/Average number of times/		
4	Cris Averaging time, count	R/W	4	Moving average/Time constant settings	R/W	
5	CH4 Averaging time, count	10,00	5	CH5 Average time/Average number of times/		
3	Cri4 Averaging time, count		5	Moving average/Time constant settings		
6	CH5 Averaging time, count		6	CH6 Average time/Average number of times/	Ī	
U	Cris Averaging time, count		O	Moving average/Time constant settings		
7	CH6 Averaging time, count		7	CH7 Average time/Average number of times/	Ī	
,	Crio Averaging time, count		,	Moving average/Time constant settings		
8	CH7 Averaging time, count		8	CH8 Average time/Average number of times/	Ī	
O	Citi Averaging time, count		O	Moving average/Time constant settings	<u> </u>	
9	CH8 Averaging time, count		9	System area (Not used)	-	
10	CH1 Digital output value		10	A/D conversion completed flag		
11	CH2 Digital output value		11	CH1 Digital output value		
12	CH3 Digital output value		12	CH2 Digital output value		
13	CH4 Digital output value	R	13	CH3 Digital output value		
14	CH5 Digital output value		14	CH4 Digital output value		
15	CH6 Digital output value		15	CH5 Digital output value	R	
16	CH7 Digital output value		16	CH6 Digital output value	<u> </u> '`	
17	CH8 Digital output value		17	CH7 Digital output value		
18			18	CH8 Digital output value		
19			19	Error code		
20			20	Setting range (CH1 to CH4)		
21			21	Setting range (CH5 to CH8)		
22			22	Offset/gain setting mode Offset specification		
23			23	Offset/gain setting mode Gain specification	<u> </u>	
24			24	Averaging process specification (CH1 to CH4)	R/W	
25	System area (Not used)	-	25	Averaging process specification (CH5 to CH8)		
26			26			
27			27	System area (Not used)		
28			28	Joystein area (Not useu)	_	
29			29			
30			30	CH1 Maximum value]	
31			31	CH1 Minimum value]	
32]		32	CH2 Maximum value]	
33			33	CH2 Minimum value	R	
34	Write data error code	R/W	34	CH3 Maximum value		
			to		1	
			44	CH8 Maximum value	1	
			45	CH8 Minimum value		

	Q68AD-G	
Address (Dec.)	Name	Read/write
46	System area (Not used)	-
	Input signal error detection extended/input	
47	signal error detection setting	R/W
48	Warning output setting	
49	Input signal error detection flag	
50	Warning output flag (Process alarm)	R
51	Warning output flag (Rate alarm)	
52	System area (Not used)	-
53	Scaling enable/disable setting	R/W
54	CH1 Scaling value	
to		R
61	CH8 Scaling value	
62	CH1 Scaling lower limit value	
63	CH1 Scaling upper limit value	
to		
76	CH8 Scaling lower limit value	
77	CH8 Scaling upper limit value	
to		
86	CH1 Process alarm lower lower limit value	
87	CH1 Process alarm lower upper limit value	
88	CH1 Process alarm upper lower limit value	
89	CH1 Process alarm upper upper limit value	
to		
114	CH8 Process alarm lower lower limit value	
115	CH8 Process alarm lower upper limit value	
116	CH8 Process alarm upper lower limit value	
117	CH8 Process alarm upper upper limit value	R/W
118	CH1 Rate alarm warning detection period	
to	3	
125	CH8 Rate alarm warning detection period	
126	CH1 Rate alarm upper limit value	
127	CH1 Rate alarm lower limit value	
to		
140	CH8 Rate alarm upper limit value	
141	CH8 Rate alarm lower limit value	
	CH1 Input signal error detection setting	
142	value/CH1 Input signal error detection lower	
	limit setting value	
to		-
	CH1 Input signal error detection upper limit	
150	setting value	
to		
158		
159	Mode switching setting	R/W
to		
200	Save data classification setting	R/W
201	System area (Not used)	-
202	CH1 Factory default offset value	
203	CH1 Factory default gain value	
to	,	R/W
232	CH8 Factory default offset value	1
233	CH8 Factory default gain value	†
	Table 1 detects actions gain value	<u> </u>

2 ANALOG INPUT MODULE REPLACEMENT

2.5 A68AD-S2 (Upgrade to Q68ADV, Q68ADI)

2.5.1 Performance comparison

If	em	A68AD-S2	
		-10 to 0 to +10VDC	
	Voltage	(Input resistance value: Hardware version K or later: $1MΩ$, Hardware version J or earlier: $30kΩ$)	
Analog input		+4 to +20mADC (Input resistance value: 250Ω)	
	Current		
		*Usable current input: -20 to 0 to 20mA	
Digital output		16-bit signed binary (-2048 to +2047)	
I/O characteristics		Analog input Digital output +10V +2000 +5V or +20mA +1000 0V or +4mA ±0 -5V or -12mA -1000 -10V -2000	
Maximum resolution		Voltage: 5mV (1/2000) Current: 20μΑ (1/1000)	
Overall accura respect to max output value)	cy (Accuracy in kimum digital	Within ±1% (±20)	

Q68ADV					Q68ADI			Precautions for replacement
	-10 to 10\							
(Inpu	ıt resistance	value: 1MΩ)		-				The voltage/current cannot be
	_			0 to	20mADC		Δ	mixed for one module.
	<u>-</u>			(Input resist	ance value	e: 250Ω)		
			t signed bina	•				
		(Normal resolut	ion mode: -4	4096 to 4095,			0	
	High res	olution mode: -	12288 to 122	287, -16384 t	o 16383)			
Analo	g input		lution mode		gh resolution			As concept of gain value is
	nge	Digital output value	Maximun resolution			Maximum resolution		changed, refer to [Analog-
	0 to 10V	output value	2.5mV	0 to 16		0.625mV	Δ	Digital Converter Module
	0 to 5V	0 to 4000	1.25mV			0.416mV		User's Manual] and then,
V (11)	1 to 5V		1.0mV	0 to 12	2000	0.333mV		confirm the I/O characteristics.
Voltage	-10 to 10V		2.5mV	-16000 to	16000	0.625mV		
	User range	-4000 to 4000	0.375mV	/ -12000 to	12000	0.333mV	 	
	settings			.2000 10	.2000			
	0 to 20mA	0 to 4000	5μA	0 to 12	2000 —	1.66µA		
Current	4 to 20mA User range		4μA			1.33μΑ	0	
	settings	-4000 to 4000	1.37µA	-12000 to	12000	1.33µA		
	•			•	•			
	Normal resolution mode			High	resolution	mode		
		nt temperature				ient temperature		
Analog inpu	Analog input		55°C Ambient		0 to 55°C			
range	With temperatu	Without temperature	temperature	With temperature	Without temperatu	temperature		
	drift	drift	25±5°C	drift	drift	25±5°C		
		tion compensation		compensation		ion		
0 to 1				±0.3%	±0.4%	±0.1%		
-10				(±48 digits)	(±64 digits			
10' 0 to						/		
Voltage 1 to							0	
Use								
rang		±0.4%	±0.1%					
settir	ngs (±12 digit		±0.1% (±4 digits)					
0 to	0	, (= =.g)	, ,,,,,,,,	±0.3%	±0.4%	±0.1%		
20m				(±36 digits)	(±48 digits	s) (±12 digits)		
Current 20m								
Use								
rang	-							
settir	ngs							
							1	1

Item	A68AD-S2	
Maximum conversion speed	Max. 2.5ms/channel	
Absolute maximum input	Voltage: ±15V Current: ±30mA	
Analog input points	8 channels/module	
Maximum number of writes for E ² PROM	-	
Isolation method	Between the input terminal and programmable controller power supply: photocoupler isolation Between channels: non-isolated	
Dielectric withstand voltage	- -	
Insulation resistance	- -	
Occupied I/O points	32 points (I/O assignment: special 32 points)	
Connected terminal	38-point terminal block	
Applicable wire size	0.75 to 2mm ² (Applicable tightening torque: 39 to 59N•cm)	
Applicable solderless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	
Internal current consumption (5VDC)	Hardware version K or later: 0.39A Hardware version J or earlier: 0.9A	
Weight	Hardware version K or later: 0.3kg Hardware version J or earlier: 0.6kg	

				△. Fartial change required, △. Incompatible
	Q68ADV	Q68ADI	Compatibility	Precautions for replacement
(Whe	80μs/cl en there is temperature drift compensa will be used regardless of the	0	The conversion speed of Q68ADV/I to A68AD-S2 has become quick. And then, on A68AD-S2, the noise that did not import on Q68ADV/I can be imported as analog signal. In this case, use the averaging processing function to remove the effect of noise.	
	±15V	±30mA	0	
	8 channel	s/module	0	
	Max. 100,	000 times	0	
	Between the I/O terminal and progr photocoupl Between channe	0		
	Between the I/O terminal and progr	rammable controller power supply:	0	
	Between the I/O terminal and prog 500VDC, 20	rammable controller power supply: MΩ or more	0	
	16 po (I/O assignment: in		Δ	I/O occupied points has changed to 16 points.
	18-point ter	minal block	×	
	0.3 to 0.75mm ²		×	Wiring change is required.
	R1.25-3 (A solderless terminal	with sleeve can not be used.)	×	
	0.64A	0.64A	Δ	The recalculation of internal current consumption [5VDC] is required.
	0.19kg	0.19kg	0	

2.5.2 Function comparison

 $\ensuremath{\mathsf{O}}$: With functions, -: Without functions

Item	Description	A68AD-S2	Q68ADV/I	Precautions for replacement
	Specifies whether to enable or disable the A/D conversion for each channel.			
A/D conversion enable/disable	By disabling the conversion for the	0	0	
AD CONVERSION Enable/disable	channels that are not used, the sampling		O	
	time can be shortened.			
Sampling processing	The A/D conversion for analog input values is performed successively for each channel, and the digital output value is output upon each conversion.	0	0	The sampling processing time changes depending on the number of channels used (number of channels set to A/D conversion enable) and whether, with or without the temperature drift compensation function. (a) Without temperature drift compensation function (processing time) = (number of channels used) × 80 (µs /1 channel) (b) With temperature drift compensation function (processing time) = (number of channels used) × 80 (µs /1 channel) + 160µs
Averaging processing	For each channel, A/D conversion values are averaged for the set number of times or set amount of time, and the average value is output as a digital value.	0	0	The setting range of average time and count differ. Refer to [Analog-Digital Converter Module User's Manual] and then, confirm the specifications.
Maximum and minimum values hold function	The maximum and minimum values of the digital output values are retained in the module.	-	0	
Temperature drift compensation function	Errors arising from changes in the ambient temperature of the module are automatically compensated for to improve conversion accuracy. The temperature drift compensation function can be performed at (A/D conversion time for all channels) + 160µs.	-	0	
Resolution mode	The resolution settings of 1/4000, 1/12000 or 1/16000 can be selected according to the application. The resolution mode setting is applicable to all channels.	-	0	
Online module change	A module change is made without the system being stopped.	-	0	Replaceable modules during online are a process CPU and a redundant CPU.

2.5.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals or sequence program, refer to the Analog-Digital Converter Module User's Manual.

	A68A	D-S2			Q68 <i>A</i>	ADV/I	
Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	Device No.	Signal name
X0	Watchdog timer error	Y0		X0	Module READY	Y0	
X1	A/D conversion READY	Y1		X1	Temperature drift compensation flag	Y1	
X2		Y2		X2		Y2	
Х3		Y3		Х3		Y3	
X4		Y4		X4	Not used	Y4	Not used
X5		Y5		X5	1100 0000	Y5	
X6		Y6		X6		Y6	
X7		Y7		X7		Y7	
X8		Y8		X8	High resolution mode status flag	Y8	
X9		Y9		X9	Operating condition setting completed flag	Y9	Operating condition setting request
XA		YA		XA	Offset/gain setting mode flag	YA	User range write request
ХВ		YB		XB	Channel change completed flag	YB	Channel change request
XC		YC		XC	Not used	YC	Not used
					Maximum value/		Maximum value
XD		YD	Makasad	XD	minimum value reset	YD	/minimum value reset
			Not used		completed flag		request
XE	Not used	YE		XE	A/D conversion completed flag	YE	Not used
XF		YF		XF	Error flag	YF	Error clear request
X10		Y10					
X11		Y11					
X12		Y12					
X13		Y13					
X14		Y14					
X15		Y15					
X16		Y16					
X17 X18		Y17 Y18					
X19		Y19					
X1A		Y1A					
X1B		Y1B					
X1C		Y1C					
X1D		Y1D					
X1E		Y1E					
X1F		Y1F					

2.5.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs. For details of the buffer memory or sequence program, refer to the Analog-Digital Converter Module User's Manual.

	A68AD-S2			Q68ADV/I	
Address (Dec.)	Name	Read/write	Address (Dec.)	Name	Read/write
0	Used channel specification		0	A/D conversion enable/disable	
1	Averaging processing specification		1	CH1 Time/count averaging setting	
2	CH1 Averaging time, count		2	CH2 Time/count averaging setting	
3	CH2 Averaging time, count		3	CH3 Time/count averaging setting	
4	CH3 Averaging time, count	D 44/	4	CH4 Time/count averaging setting	D.04/
5	CH4 Averaging time, count	R/W	5	CH5 Time/count averaging setting	R/W
6	CH5 Averaging time, count		6	CH6 Time/count averaging setting	
7	CH6 Averaging time, count		7	CH7 Time/count averaging setting	
8	CH7 Averaging time, count		8	CH8 Time/count averaging setting	
9	CH8 Averaging time, count		9	Averaging processing specification	1
10	CH1 Digital output value		10	A/D conversion completed flag	
11	CH2 Digital output value		11	CH1 Digital output value	
12	CH3 Digital output value		12	CH2 Digital output value	
13	CH4 Digital output value	_	13	CH3 Digital output value	
14	CH5 Digital output value	R	14	CH4 Digital output value	-
15	CH6 Digital output value		15	CH5 Digital output value	
16	CH7 Digital output value		16	CH6 Digital output value	R
17	CH8 Digital output value		17	CH7 Digital output value	
18			18	CH8 Digital output value	
19			19	Error code	
20			20	Setting range (CH1 to CH4)	1
21			21	Setting range (CH5 to CH8)	1
22			22	Offset/gain setting mode Offset specification	
23			23	Offset/gain setting mode Gain specification	R/W
24			24	The contract of the contract o	
25			25		
26	System area (Not used)	-	26		
27			27	System area (Not used)	-
28			28		
29			29		
30			30	CH1 Maximum value	
31			31	CH1 Minimum value	1
32			32	CH2 Maximum value	
33			33	CH2 Minimum value	1
34	Write data error code	R/W	34	CH3 Maximum value	
35	A/D conversion completed flag	R	35	CH3 Minimum value	
33	A/D conversion completed liag	IX	36	CH4 Maximum value	1
			37	CH4 Minimum value	1
			38	CH5 Maximum value	R
			39	CH5 Minimum value	-
			40		+
				CH6 Maximum value CH6 Minimum value	-
			41	CH7 Maximum value	-
			42		1
			43	CH2 Maximum value	1
			44	CH8 Maximum value	4
			45	CH8 Minimum value	

	Q68ADV/I	
Address	Nama	Dood/write
(Dec.)	Name	Read/write
46		
to	System area (Not used)	-
157		
158	Made authorize action	DAM
159	Mode switching setting	R/W
160		
to	System area (Not used)	-
201		
202	CH1 Industrial shipment settings offset value	
203	CH1 Industrial shipment settings gain value	
204	CH2 Industrial shipment settings offset value	
205	CH2 Industrial shipment settings gain value	
206	CH3 Industrial shipment settings offset value	
207	CH3 Industrial shipment settings gain value	
208	CH4 Industrial shipment settings offset value	
209	CH4 Industrial shipment settings gain value	
210	CH5 Industrial shipment settings offset value	
211	CH5 Industrial shipment settings gain value	
212	CH6 Industrial shipment settings offset value	
213	CH6 Industrial shipment settings gain value	
214	CH7 Industrial shipment settings offset value	
215	CH7 Industrial shipment settings gain value	
216	CH8 Industrial shipment settings offset value	
217	CH8 Industrial shipment settings gain value	DAM
218	CH1 User range settings offset value	R/W
219	CH1 User range settings gain value	
220	CH2 User range settings offset value	
221	CH2 User range settings gain value	
222	CH3 User range settings offset value	
223	CH3 User range settings gain value	
224	CH4 User range settings offset value	
225	CH4 User range settings gain value	
226	CH5 User range settings offset value	
227	CH5 User range settings gain value	
228	CH6 User range settings offset value	
229	CH6 User range settings gain value	
230	CH7 User range settings offset value	
231	CH7 User range settings gain value	
232	CH8 User range settings offset value	
233	CH8 User range settings gain value	

2.6 A68AD-S2 (Upgrade to Q68AD-G)

2.6.1 Performance comparison

ľ	tem	A68AD-S2					
Analog input	Voltage	-10 to 0 to +10VDC (Input resistance value: Hardware version K or later: $1M\Omega$, Hardware version J or earlier: $30k\Omega$)					
Analog Input	Current	+4 to +20mADC (Input resistance value: 250Ω) *Usable current input: -20 to 0 to 20mA					
Digital output		16-bit signed binary (-2048 to +2047)					
I/O characteris	stics	Analog input Digital output +10V +2000 +5V or +20mA +1000 0V or +4mA ±0 -5V or -12mA -1000 -10V -2000					
Maximum reso	olution	Voltage: 5mV (1/2000) Current: 20μΑ (1/1000)					
Overall accura respect to max output value)	acy (Accuracy in ximum digital	Within ±1% (±20)					

					0.	•	tiai change required, x. incompatible			
			68AD-G			Compatibility	Precautions for replacement			
-10 to 10VDC										
	(Input resistance								
		0 to								
		(Input resista								
		16-bit s								
	(1)	Normal resolutio	-	to 4095		0				
	`			-16384 to 16383)	1					
	riigiricool	attorr mode. 12	200 to 12201,	1000+10 10000)	'					
	1		I. C I.	18.61	e					
l lament	A	Normal reso		High resolu						
Input	Analog input range	Digital	Maximum resolution	Digital	Maximum resolution					
	0 to 10V	output value		output value 0 to 16000	0.625mV					
	0 to 10V	0 to 4000	2.5mV 1.25mV	0 to 12000	0.625IIIV 0.416mV					
	1 to 5V		1.25mV		0.416IIIV 0.333mV					
Voltage	1 to 5V	-1000 to 4500		1.01110			0.33	0.333111		As concept of gain value is
Voltage	(Expanded mode)		00 to 4500 1.0mV	-3000 to 13500	0.333mV	Δ	changed, refer to Q68AD-G			
	-10 to 10V		2.5mV	-16000 to 16000	0.625mV	1	[User's Manual] and then,			
	Users range setting	-4000 to 4000	0.375mV	-12000 to 12000	0.333mV		confirm the I/O characteristics.			
	0 to 20mA		5μΑ		1.66µA					
	4 to 20mA	0 to 4000	4µA	0 to 12000	1.33µA					
Current	4 to 20mA	40004 4500		20004 40500	·					
	(Expanded mode)	-1000 to 4500	4μA	-3000 to 13500	1.33µA					
	Users range setting	-4000 to 4000	1.37µA	-12000 to 12000	1.33µA					
		:	±0.1%							
		Normal resolu								
	High res	olution mode (0	0							
	High resoluti	on mode (Other	than the above	e ranges): ±12 diç	gits					
	Tempera	ature coefficient:	: ±71.4ppm/°C	(0.00714%/°C)						

Item	A68AD-S2	
Maximum conversion speed	Max. 2.5ms/channel	
Response time	-	
Absolute maximum input	Voltage: ±15V Current: ±30mA	
Analog input points	8 channels/module	
Maximum number of writes for E ² PROM	-	
Isolation method	Between the input terminal and programmable controller power supply: photocoupler isolation Between channels: non-isolated	
Dielectric withstand voltage	-	
Insulation resistance	-	
Occupied I/O points	32 points (I/O assignment: special 32 points)	
Connected terminal	38-point terminal block	
Applicable wire size	0.75 to 2mm ² (Applicable tightening torque: 39 to 59N•cm)	
Applicable solderless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	
Internal current consumption (5VDC)	Hardware version K or later: 0.39A Hardware version J or earlier: 0.9A	
Weight	Hardware version K or later: 0.3kg Hardware version J or earlier: 0.6kg	

	•	
Q68AD-G	Compatibility	Precautions for replacement
10ms/channel		The conversion speed of Q68AD-G to
(Sampling cycle)		A68AD has become slow. If fast
20		conversion speed is required for
20ms		control, the Q64AD is recommended.
Voltage: ±15V		
current: ±30mA	0	
8 channels/module	0	
Up to 50,000 times	0	
Between the I/O terminal and programmable controller power supply:		
transformer isolation	0	
Between channels: transformer isolation		
Between the I/O terminal and programmable controller power supply:		
500VACrms, for 1 minute	0	
Between analog input channels: 1000VACrms, for 1 minute		
Between the I/O terminal and programmable controller power supply:		
500VDC, $10M\Omega$ or more	0	
Between analog input channels: 500VDC, 10M Ω or more		
16 points		I/O occupied points has changed to
(I/O assignment: intelligent 16 points)	Δ	16 points.
40-pin connector	×	
Within 0.3mm ²	×	Wiring change is required.
-	×	
0.46A	Δ	The recalculation of internal current
33.		consumption [5VDC] is required.
0.16kg	0	

2.6.2 Function comparison

O: With functions, -: Without functions

Item	Description	A68AD-S2	Q68AD-G	O: With functions, -: Without functions Precautions for replacement
TOTAL	Specifies whether to enable or disable the	AOOAD OL	GOOAD C	resultions for replacement
	A/D conversion for each channel.			
A/D conversion enable/disable	By disabling the conversion for the	0	0	
7 VB CONVENSION CHASIC/GISUSIC	channels that are not used, the sampling			
	time can be shortened.			
	The A/D conversion for analog input values			
	is performed successively for each channel,			
Sampling processing	and the digital output value is output upon	0	0	
	each conversion.			
	For each channel, A/D conversion values			
	are averaged for the set number of times or			The setting range of average
	set amount of time, and the average value	0	0	time and count differ.
Averaging processing	is output as a digital value.			Refer to Q68AD-G [User's
Averaging processing	<u> </u>			· ·
	Moving average takes the average of the			Manual] and then, confirm the specifications.
	specified number of digital output values	-	0	specifications.
	measured per sampling time.			
Primary delay filter	A digital output value is smoothed	-	0	
	according to the preset time constant.			
Maximum and minimum values	The maximum and minimum values of the			
hold function	digital output values are retained in the	-	0	
	module.			
	The resolution can be switched according to		_	
Resolution mode	the application. The resolution mode is	-	0	
	batch-set for all the channels. 1			
Input signal error detection	The voltage/current outside the setting	_	0	
function	range is detected.		Ŭ	
	(1) Process alarm			
	A warning is output if a digital output			
	value falls outside the setting range.			
Warning output function	(2) Rate alarm	-	0	
	A warning is output if the varying rate of			
	a digital output value falls outside the			
	preset varying rate range.			
	Conversion of A/D conversion values to			
	preset percentage values and loading into			
Scaling function	the buffer memory is available.	-	0	
	Programming steps for the scaling can be			
	eliminated.			
	A module change is made without the			Replaceable modules during
Online module change	system being stopped.	-	0	online are a process CPU and a
	System being stopped.			redundant CPU.

For the A68AD-S2, the resolution for voltage is 1/2000 and that for current is 1/1000 (fixed). For the Q68AD-G, the resolution for voltage and current is 1/4000 in the normal resolution mode, while the resolution for the voltage from -10 to 10V is 1/16000 and the resolution for the voltage in other ranges and current is 1/12000 in the high resolution mode.

2.6.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals or sequence program, refer to the Channel Isolated Analog-Digital Converter Module, Channel Isolated Analog-Digital Converter Module (With Signal Conditioning Function) User's Manual.

	A68AD-S2				Q68AD-G			
Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	
X0	Watchdog timer error	Y0		X0	Module READY	Y0		
X1	A/D conversion READY	Y1		X1		Y1		
X2 X3		Y2 Y3		X2 X3		Y2 Y3		
X4		Y4		X4	Not used	Y4		
X5		Y5		X5		Y5	Not used	
X6		Y6		X6		Y6		
X7		Y7		X7	High resolution mode status flag	Y7		
X8		Y8		X8	Warming output signal	Y8		
X9		Y9		X9	Operating condition setting completed flag	Y9	Operating condition setting request	
XA		YA		XA	Offset/gain setting mode flag	YA	User range write request	
XB		YB		XB	Channel change completed flag	YB	Channel change request	
XC		YC		XC	Input signal error detection signal	YC	Not used	
					Maximum value/		Maximum value/	
XD		YD	Not used	XD	minimum value reset	YD	minimum value reset	
	Not used				completed flag A/D conversion		request	
XE		YE		XE	completed flag	YE	Not used	
XF		YF		XF	Error flag	YF	Error clear request	
X10 X11		Y10 Y11						
X12		Y12						
X13		Y13						
X14		Y14						
X15		Y15						
X16		Y16						
X17		Y17						
X18 X19		Y18 Y19						
X1A		Y1A						
X1B		Y1B						
X1C		Y1C						
X1D		Y1D						
X1E		Y1E						
X1F		Y1F						

2.6.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs. For details of the I/O signals or sequence program, refer to the Channel Isolated Analog-Digital Converter Module, Channel Isolated Analog-Digital Converter Module (With Signal Conditioning Function) User's Manual.

	A68AD-S2			Q68AD-G	
Address (Dec.)	Name	Read/write	Address (Dec.)	Name	Read/write
0	Used channel specification		0	A/D conversion enable/disable	
1	Averaging processing energinesis		1	CH1 Average time/Average number of times/	
1	Averaging processing specification		1	Moving average/Time constant settings	
2	CLIA Averaging time, count		•	CH2 Average time/Average number of times/	
2	CH1 Averaging time, count		2	Moving average/Time constant settings	
3	CH2 Averaging time, sount		3	CH3 Average time/Average number of times/	
3	CH2 Averaging time, count		3	Moving average/Time constant settings	
4	CH3 Averaging time, count		4	CH4 Average time/Average number of times/	
4	Ch3 Averaging time, count	R/W	4	Moving average/Time constant settings	R/W
5	CH4 Averaging time, sount	T F/VV	5	CH5 Average time/Average number of times/	
5	CH4 Averaging time, count		5	Moving average/Time constant settings	
6	CLIE Averaging time, count		6	CH6 Average time/Average number of times/	
6	CH5 Averaging time, count		6	Moving average/Time constant settings	
7	CLIC Averaging times asset		7	CH7 Average time/Average number of times/	
7	CH6 Averaging time, count		7	Moving average/Time constant settings	
0	OUT Assessment for a second			CH8 Average time/Average number of times/	
8	CH7 Averaging time, count		8	Moving average/Time constant settings	
9	CH8 Averaging time, count		9	System area (Not used)	-
10	CH1 Digital output value		10	A/D conversion completed flag	
11	CH2 Digital output value		11	CH1 Digital output value	_
12	CH3 Digital output value		12	CH2 Digital output value	_
13	CH4 Digital output value	1 .	13	CH3 Digital output value	_
14	CH5 Digital output value	R	14	CH4 Digital output value	_
15	CH6 Digital output value		15	CH5 Digital output value	† _
16	CH7 Digital output value		16	CH6 Digital output value	R
17	CH8 Digital output value		17	CH7 Digital output value	_
18			18	CH8 Digital output value	
19	1		19	Error code	_
20	1		20	Setting range (CH1 to CH4)	
21	1		21	Setting range (CH5 to CH8)	
22	1		22	Offset/gain setting mode Offset specification	
23	1		23	Offset/gain setting mode Gain specification	
0.4	1		0.4	Averaging process specification (CH1 to	D/4/
24			24	CH4)	R/W
25	System area (Not used)	-	25	Averaging process specification (CH5 to CH8)	
26	1		26		
27	1		27	Curata managa (Nigat uga di)	
28	1		28	System area (Not used)	-
29	1		29		
30	1		30	CH1 Maximum value	
31	1		31	CH1 Minimum value	†
32	1		32	CH2 Maximum value	†
33	1		33	CH2 Minimum value	1 _
34	Write data error code	R/W	34	CH3 Maximum value	R
35	A/D conversion completed flag	R	to		1
		•	44	CH8 Maximum value	†
					•

	Q68AD-G	
Address	Name	Read/write
(Dec.)		
46	System area (Not used)	-
47	Input signal error detection extended/input	5.44
- 10	signal error detection setting	R/W
48	Warning output setting	
49	Input signal error detection flag	_
50	Warning output flag (Process alarm)	R
51	Warning output flag (Rate alarm)	
52	System area (Not used)	-
53	Scaling enable/disable setting	R/W
54	CH1 Scaling value	
to	OUR O II	R
61	CH8 Scaling value	
62	CH1 Scaling lower limit value	
63	CH1 Scaling upper limit value	
to		
76	CH8 Scaling lower limit value	
77	CH8 Scaling upper limit value	
to		
86	CH1 Process alarm lower lower limit value	
87	CH1 Process alarm lower upper limit value	
88	CH1 Process alarm upper lower limit value	
89	CH1 Process alarm upper upper limit value	
to		
114	CH8 Process alarm lower lower limit value	
115	CH8 Process alarm lower upper limit value	
116	CH8 Process alarm upper lower limit value	
117	CH8 Process alarm upper upper limit value	R/W
118	CH1 Rate alarm warning detection period	
to		
125	CH8 Rate alarm warning detection period	
126	CH1 Rate alarm upper limit value	
127	CH1 Rate alarm lower limit value	
to		
140	CH8 Rate alarm upper limit value	
141	CH8 Rate alarm lower limit value	
	CH1 Input signal error detection setting	
142	value/CH1 Input signal error detection lower	
	limit setting value	
to	Olid land single constraint of the constraint of	
150	CH1 Input signal error detection upper limit	
	setting value	
to		
158	Mode switching setting	R/W
159		
to		D
200	Save data classification setting	R/W
201	System area (Not used)	-
202	CH1 Factory default offset value	
203	CH1 Factory default gain value	
to		R/W
232	CH8 Factory default offset value	
233	CH8 Factory default gain value	

2.7 A68ADN (Upgrade to Q68ADV, Q68ADI)

2.7.1 Performance comparison

It	em		A68AI	DN					
Analog input	Voltage	-10 to 0 to +10VDC (Input resistance value: $1M\Omega$)							
, maiog impat	Current	-20 to 0 to +20mADC (Input resistance value: 250Ω)							
			16-bit signe						
Digital output			n 1/4000 is set						
Digital output			n 1/8000 is set						
		When	1/12000 is set:	-12288 to +12	2287				
			Di	gital output valu	ıe				
		Analog input		5V/20mA, offse					
			1/4000	1/8000	1/12000				
I/O characteris	tics	+10V	+4000	+8000	+12000				
		+5V or +20mA	+2000	+4000	+6000				
		0V or 20mA	0	0	0				
		-5V or -20mA -10V	-2000 -4000	-4000 -8000	-6000 -12000				
				<u> </u>					
		(Fa	ctory-set: gain	.5V, offset0	V)				
			1/4000	1/8000	1/12000	1			
Maximum reso	olution	Voltage input	2.5mV	1.25mV	0.83mV	1			
		Current input	10µA	5μA	3.33µA				
							+		
			1/4000	1/8000	1/12000				
		±1%	±40	±80	±120]			
Overall accura									
(Accuracy in re									
maximum digit	al output value)								

	Q68ADV					Q68ADI		Compatibility	Precautions for replacement
	-10 to 10VDC								
	(Input resistance value: 1MΩ)				-			Δ	The voltage/current cannot be
					0 to	20mADC			mixed for one module.
					(Input resista	ance value:	: 250Ω)		
			16-bi	t signed bina	ary				
			(Normal resolut	-	-			0	
		High res	olution mode: -1	2288 to 122	287, -16384 to	o 16383)			
								+	
			Normal reso	lution mode	Hic	gh resolution	mode		
		g input	Digital	Maximum	`		Maximum		
	Id	nge	output value	resolution	output	value	resolution		As concept of gain value is
		0 to 10V		2.5mV	0 to 16		0.625mV	_	changed, refer to [Analog-
		0 to 5V 1 to 5V	0 to 4000	1.25mV 1.0mV	0 to		0.416mV 0.333mV	Δ	Digital Converter Module User's Manual] and then,
	Voltage	-10 to 10V		2.5mV	-16000 to		0.625mV		confirm the I/O characteristics.
		User range	-4000 to 4000	0.375mV			0.333mV		on a contractoristics
		settings			-12000 10	12000			
		0 to 20mA	0 to 4000	5μA	0 to 12	2000	1.66µA	-	
	Current	4 to 20mA User range		4µA			1.33μΑ		
		_	-4000 to 4000	1.37µA	-12000 to	12000	1.33µA		
		settings							
L		settings		· ·				0	
		settings		· .				0	
		settings		· ·				0	
L			lormal resolution n			n resolution r		0	
		1	lormal resolution n temperature 0 to		High Ambient tem	n resolution r	node	0	
	Analog inp	Ambien	lormal resolution n temperature 0 to 55°C		High Ambient tem 55	n resolution r perature 0 to °C	node	0	
	Analog inp range	Ambien with	lormal resolution n temperature 0 to 55°C Without	node Ambient temperature	High Ambient tem 55 With	n resolution r perature 0 to °C Without	node Ambient temperature	0	
		Ambien	lormal resolution n temperature 0 to 55°C Without	node - Ambient	High Ambient tem 55	n resolution r perature 0 to °C	node Ambient temperature	0	
	range	Ambien ut With temperal drift compens:	lormal resolution n temperature 0 to 55°C Without temperature	Ambient temperature 25±5°C	High Ambient tem 55 With temperature	n resolution riperature 0 to °C Without temperature drift	Ambient temperature 25±5°C	0	
	range 0 to	Ambien With temperal drift compens:	lormal resolution n temperature 0 to 55°C Without temperature drift	Ambient temperature 25±5°C	High Ambient tem 55 With temperature drift	n resolution riperature 0 to °C Without temperature drift	Ambient temperature 25±5°C	0	
	range 0 to -10	Ambien With temperal drift compens:	lormal resolution n temperature 0 to 55°C Without temperature drift	Ambient temperature 25±5°C	High Ambient tem 55 With temperature drift compensation	n resolution r perature 0 to °C Without temperatur drift compensatio	Ambient temperature 25±5°C on ±0.1%	0	
	0 to -10	Ambien With temperal drift compensatory to V	lormal resolution n temperature 0 to 55°C Without temperature drift	Ambient temperature 25±5°C	High Ambient tem 55 With temperature drift compensation ±0.3%	n resolution reperature 0 to compensation drift compensation ±0.4%	Ambient temperature 25±5°C on ±0.1%	0	
	0 to -10	Ambien With temperal drift compensa	lormal resolution n temperature 0 to 55°C Without temperature drift	Ambient temperature 25±5°C	High Ambient tem 55 With temperature drift compensation ±0.3%	n resolution reperature 0 to compensation drift compensation ±0.4%	Ambient temperature 25±5°C on ±0.1%	0	
	0 to -10 10 Voltage 1 to Us	Ambien With temperal drift compensal 10V to V 5V 5V er	lormal resolution n temperature 0 to 55°C Without temperature drift	Ambient temperature 25±5°C	High Ambient tem 55 With temperature drift compensation ±0.3%	n resolution reperature 0 to compensation drift compensation ±0.4%	Ambient temperature 25±5°C on ±0.1%		
	0 to -10 10 Voltage 1 to Us	Ambien ut With temperal drift compensal 10V to V 5V er ge +0.3%	lormal resolution n temperature 0 to 55°C Without temperature drift tion compensation	Ambient temperature 25±5°C	High Ambient tem 55 With temperature drift compensation ±0.3%	n resolution reperature 0 to compensation drift compensation ±0.4%	Ambient temperature 25±5°C on ±0.1%		
	Voltage 0 to 10 to	Ambien With temperate drift compensation 10V to V 5V er ge #0.3% (±12 dig	lormal resolution n temperature 0 to 55°C Without temperature drift tion compensation	- Ambient temperature 25±5°C	High Ambient tem 55 With temperature drift compensation ±0.3% (±48 digits)	n resolution r perature 0 to °C Without temperatur drift compensatio ±0.4% (±64 digits	Ambient temperature 25±5°C on ±0.1% (±16 digits)		
	0 to -10 10 Voltage 1 to Us	Ambien With temperate drift compensation 10V to V 5V er ge #0.3% (±12 dig	lormal resolution n temperature 0 to 55°C Without temperature drift tion compensation	- Ambient temperature 25±5°C	High Ambient tem 55 With temperature drift compensation ±0.3%	n resolution reperature 0 to compensation drift compensation ±0.4%	Ambient temperature 25±5°C on ±0.1% ±0.1%		
-	0 to -10 10 1	Ambien With temperate drift compensation 10V to V 5V 5V er ge ngs to nA	lormal resolution n temperature 0 to 55°C Without temperature drift tion compensation	- Ambient temperature 25±5°C	High Ambient tem 55 With temperature drift compensation ±0.3% (±48 digits)	n resolution r perature 0 to °C Without temperatur drift compensatio ±0.4% (±64 digits	Ambient temperature 25±5°C on ±0.1% ±0.1%		
-	Voltage 0 to -10 1 to Us ran setti 0 20i 4 Current 20i to 10	Ambien With temperate drift compensation 10V 5V 5V er ge ngs to nA to nA	lormal resolution n temperature 0 to 55°C Without temperature drift tion compensation	- Ambient temperature 25±5°C	High Ambient tem 55 With temperature drift compensation ±0.3% (±48 digits)	n resolution r perature 0 to °C Without temperatur drift compensatio ±0.4% (±64 digits	Ambient temperature 25±5°C on ±0.1% ±0.1%		
-	0 to -10 10 10 10 10 10 10 1	Ambien With temperate drift compensation 10V 5V 5V er ge ngs to nA to nA er	lormal resolution n temperature 0 to 55°C Without temperature drift tion compensation	- Ambient temperature 25±5°C	High Ambient tem 55 With temperature drift compensation ±0.3% (±48 digits)	n resolution r perature 0 to °C Without temperatur drift compensatio ±0.4% (±64 digits	Ambient temperature 25±5°C on ±0.1% ±0.1%		
-	Voltage 0 to -10 1 to Us ran setti 0 20i 4 Current 20i to 10	Ambien With temperate drift compensation 10V to V 5V er ge #0.3% (±12 dig mA er ge	lormal resolution n temperature 0 to 55°C Without temperature drift tion compensation	- Ambient temperature 25±5°C	High Ambient tem 55 With temperature drift compensation ±0.3% (±48 digits)	n resolution r perature 0 to °C Without temperatur drift compensatio ±0.4% (±64 digits	Ambient temperature 25±5°C on ±0.1% ±0.1%		

Item	A68ADN	
Maximum conversion speed	20ms/channel	
Absolute maximum input	Voltage: ±15V	
Absolute maximum input	Current: ±30mA	
Analog input points	8 channel/module	
Maximum number of writes for		
E ² PROM	<u> </u>	
Isolation method	Between the input terminal and programmable controller power supply: photocoupler isolation Between channels: non-isolated	
Dielectric withstand voltage	Between the I/O terminal and programmable controller power supply: 500VAC, for 1 minute	
Insulation resistance	Between the I/O terminal and programmable controller power supply: 500VDC, 5M Ω or more	
Occupied I/O points	32 points	
Occupied i/O points	(I/O assignment: special 32 points)	
Connected terminal	38-point terminal block	
Applicable wire size	0.75 to 2mm ²	
Applicable wire size	(Applicable tightening torque: 39 to 59N•cm)	
Applicable solderless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	
Internal current consumption	0.4A	
(5VDC)	V.T/1	
Weight	0.51kg	

Q68ADV	Q68ADI	Compatibility	Precautions for replacement		
80μs/c (When there is temperature calculated by adding 160 μs will be use use	0	The conversion speed of Q68ADV/I to A68ADN has become quick. And then, on Q68ADV/I, the noise that did not import on A68ADN can be imported as analog signal. In this case, use the averaging processing function to remove the effect of noise.			
±15V	±30mA	0			
8 channel	ls/module	0			
Max. 100,	000 times	0			
photocoupl	Between the I/O terminal and programmable controller power supply: photocoupler isolation Between channels: non-isolated				
Between the I/O terminal and progr	rammable controller power supply: or 1 minute	0			
Between the I/O terminal and progr	rammable controller power supply: MΩ or more	0			
16 po (I/O assignment: in		Δ	I/O occupied points has changed to 16 points.		
18-point ter	minal block	×			
0.3 to 0.	.75mm ²	×	Wiring change is required.		
R1.25-3 (A solderless terminal	R1.25-3 (A solderless terminal with sleeve can not be used.)				
0.64A	0.64A	Δ	The recalculation of internal current consumption [5VDC] is required.		
 0.19kg	0.19kg	0			

2.7.2 Function comparison

 $\ensuremath{\mathsf{O}}$: With functions, -: Without functions

Item	Description	A68ADN	Q68ADV/I	Precautions for replacement
A/D conversion enable/disable	Specifies whether to enable or disable the A/D conversion for each channel. By disabling the conversion for the channels that are not used, the sampling time can be shortened.	0	0	
Sampling processing	The A/D conversion for analog input values is performed successively for each channel, and the digital output value is output upon each conversion.	0	0	The sampling processing time changes depending on the number of channels used (number of channels set to A/D conversion enable) and whether, with or without the temperature drift compensation function. (a) Without temperature drift compensation function (processing time) = (number of channels used) × 80 (µs /1 channel) (b) With temperature drift compensation function (processing time)= (number of channels used) × 80 (µs /1 channel) + 160µs
Averaging processing	For each channel, A/D conversion values are averaged for the set number of times or set amount of time, and the average value is output as a digital value.	0	0	The setting range of average time and count differ. Refer to [Analog-Digital Converter Module User's Manual] and then, confirm the specifications.
Maximum and minimum values hold function	The maximum and minimum values of the digital output values are retained in the module.	-	0	
Temperature drift compensation function	Errors arising from changes in the ambient temperature of the module are automatically compensated for to improve conversion accuracy. The temperature drift compensation function can be performed at (A/D conversion time for all channels) + 160µs.	-	0	
Resolution mode	The resolution can be switched according to the application. The resolution mode is batch-set for all the channels.*1	0	0	
Online module change	A module change is made without the system being stopped.	-	0	Replaceable modules during online are a process CPU and a redundant CPU.

For the A68ADN, the resolution for voltage and current can be set to 1/4000, 1/8000, or 1/12000. For the Q68ADV/I, the resolution for voltage and current is 1/4000 in the normal resolution mode, while the resolution for the $voltage from -10 \ to \ 10V \ is \ 1/16000 \ and \ the \ resolution for \ the \ voltage \ in \ other \ ranges \ and \ current \ is \ 1/12000 \ in \ the \ high$ resolution mode.

2.7.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals or sequence program, refer to the Analog-Digital Converter Module User's Manual.

	A68	ADN		Q68ADV/I				
Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	
X0 X1	Watchdog timer error A/D conversion READY	Y0 Y1		X0 X1	Module READY Temperature drift compensation flag	Y0 Y1		
X2 X3	Error flag	Y2 Y3		X2 X3		Y2 Y3		
X4 X5		Y4 Y5		X4 X5	Not used	Y4 Y5	Not used	
X6 X7		Y6 Y7	Not used	X6 X7	I l'ale acceptation accepta	Y6 Y7		
X8		Y8		X8	High resolution mode status flag Operating condition	Y8	Operating condition	
X9		Y9		X9	setting completed flag Offset/gain setting mode	Y9	setting request	
XA XB		YA YB		XA	flag Channel change	YA YB	User range write request	
XC		YC		XC	completed flag Not used	YC	Channel change request Not used	
XD	Not used	YD	RFRP, RTOP instruction for interlock signal when	XD	Maximum value/ minimum value reset completed flag	YD	Maximum value/ minimum value reset request	
XE		YE	A68ADN is used in remote I/O station	XE	A/D conversion completed flag	YE	Not used	
XF X10 X11		YF Y10 Y11	Not used	XF	Error flag	YF	Error clear request	
X12 X13		Y12 Y13	Error reset					
X14 X15		Y14 Y15						
X16 X17		Y16 Y17						
X18 X19 X1A		Y18 Y19 Y1A	Not used					
X1B X1C		Y1B Y1C						
X1D X1E	RFRP, RTOP instruction for interlock signal when	Y1D Y1E						
X1F	A68ADN is used in remote I/O station	Y1F						

2.7.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs. For details of the buffer memory or sequence program, refer to the Analog-Digital Converter Module User's Manual.

	A68ADN		Q68ADV/I				
Address (Dec.)	Name	Read/write	Address (Dec.)	Name	Read/write		
0	A/D conversion enable/disable setting		0	A/D conversion enable/disable			
1	Averaging processing specification		1	CH1 Time/count averaging setting			
2	CH1 Averaging time, count		2	CH2 Time/count averaging setting			
3	CH2 Averaging time, count		3	CH3 Time/count averaging setting			
4	CH3 Averaging time, count	R/W	4	CH4 Time/count averaging setting	R/W		
5	CH4 Averaging time, count	R/VV	5	CH5 Time/count averaging setting	R/VV		
6	CH5 Averaging time, count		6	CH6 Time/count averaging setting			
7	CH6 Averaging time, count		7	CH7 Time/count averaging setting			
8	CH7 Averaging time, count		8	CH8 Time/count averaging setting			
9	CH8 Averaging time, count		9	Averaging processing specification			
10	CH1 Digital output value		10	A/D conversion completed flag			
11	CH2 Digital output value	_	11	CH1 Digital output value			
12	CH3 Digital output value	-	12	CH2 Digital output value			
13	CH4 Digital output value	_	13	CH3 Digital output value			
14	CH5 Digital output value		14	CH4 Digital output value			
15	CH6 Digital output value	R	15	CH5 Digital output value			
16	CH7 Digital output value	_	16	CH6 Digital output value	R		
17	CH8 Digital output value	_	17	CH7 Digital output value			
18	Write data error code	_	18	CH8 Digital output value			
19	A/D conversion completed flag	<u>-</u>	19	Error code			
20	Resolution setting	R/W	20	Setting range (CH1 to CH4)			
20	rvesolution setting	17/77	21	Setting range (CH5 to CH8)			
			21	Offset/gain setting mode			
			22	Offset specification			
				Offset/gain setting mode	R/W		
			23	Gain specification			
			24	Can specification			
			25				
			26				
			27	System area (Not used)	-		
			28 29				
				CHA Mavianum value			
			30	CH1 Maximum value			
			31	CH1 Minimum value			
			32	CH2 Maximum value			
			33	CH2 Minimum value			
			34	CH3 Maximum value			
			35	CH3 Minimum value			
			36	CH4 Maximum value			
			37	CH4 Minimum value	R		
			38	CH5 Maximum value			
			39	CH5 Minimum value			
			40	CH6 Maximum value			
			41	CH6 Minimum value			
			42	CH7 Maximum value			
			43	CH7 Minimum value			
			44	CH8 Maximum value			
			45	CH8 Minimum value			

	Q68ADV/I	
Address	Nama	Doodhuuite
(Dec.)	Name	Read/write
46		
to	System area (Not used)	-
157		
158	Mode switching setting	R/W
159 160		
to	System area (Not used)	
201	System area (Not used)	-
201	CH1 Industrial abinment acttings offset value	
202	CH1 Industrial shipment settings offset value	
	CH3 Industrial shipment settings gain value	
204	CH2 Industrial shipment settings offset value	
205	CH2 Industrial shipment settings gain value	
206	CH3 Industrial shipment settings offset value	
_	CH3 Industrial shipment settings gain value	
208	CH4 Industrial shipment settings offset value	
209	CH4 Industrial shipment settings gain value	
210	CH5 Industrial shipment settings offset value	
211	CH5 Industrial shipment settings gain value	
212	CH6 Industrial shipment settings offset value	
213	CH6 Industrial shipment settings gain value	
214	CH7 Industrial shipment settings offset value	
215	CH7 Industrial shipment settings gain value	
216	CH8 Industrial shipment settings offset value	
217	CH8 Industrial shipment settings gain value	R/W
218	CH1 User range settings offset value	
219	CH1 User range settings gain value	
220	CH2 User range settings offset value	
221	CH2 User range settings gain value	
222	CH3 User range settings offset value	
223	CH3 User range settings gain value	
224	CH4 User range settings offset value	
225	CH4 User range settings gain value	
226	CH5 User range settings offset value	
227	CH5 User range settings gain value	
228	CH6 User range settings offset value	
229	CH6 User range settings gain value	
230	CH7 User range settings offset value	
231	CH7 User range settings gain value	
232	CH8 User range settings offset value	
233	CH8 User range settings gain value	

2.8 A68AD (Upgrade to Q68AD-G)

2.8.1 Performance comparison

It	tem		A68A	DN					
Analog input	Voltage	-10 to 0	-10 to 0 to +10VDC (Input resistance value: $1M\Omega$)						
Analog input	Current	-20 to 0 t	o +20mADC (Inpu	t resistance va	ılue: 250Ω)				
Digital output		V	16-bit signe When 1/4000 is set When 1/8000 is set nen 1/12000 is set:	:: -4096 to +40 :: -8192 to +81	91				
I/O characteris	otics	+10V +5V or +20n 0V or 20m -5V or -20m	ut (When gai 1/4000 +4000 mA +2000 A 0	oigital output valu n 5V/20mA, offs 1/8000 +8000 +4000 0 -4000 -8000	et 0V/0mA) 1/12000 +12000 +6000 0 -6000 -12000				
Maximum reso	olution	Voltage inp Current inp	1/4000 out 2.5mV	1/8000 1.25mV 5μA	1/12000 0.83mV 3.33μA				
Overall accura (Accuracy in remaximum digit	•	±1%	1/4000 ±40	1/8000 ±80	1/12000 ±120				

					U:	•	tial change required, ×: Incompatible
		Q	68AD-G			Compatibility	Precautions for replacement
		-10					
	(Input resistance	_				
		0 to	20mADC	·		0	
		(Input resista	ance value: 250	00)			
		(par.100.01					
		16-bit s	signed binary				
	(1)	lormal resolution	n mode: -4096	to 4095,		0	
	High resol	ution mode: -12	288 to 12287,	-16384 to 16383)			
		Normal reso	lution mode	High resolu	tion mode		
Input	Analog input range	Digital	Maximum	Digital	Maximum		
		output value	resolution	output value	resolution		
	0 to 10V	0 to 4000	2.5mV	0 to 16000	0.625mV		
	0 to 5V		1.25mV	0 to 12000	0.416mV		
	1 to 5V		1.0mV		0.333mV		As concept of gain value is
Voltage	1 to 5V	-1000 to 4500	1.0mV	-3000 to 13500	0.333m\/	D.625mV △	changed, refer to Q68AD-G
	(Expanded mode)		1.01114	0000 to 10000			[User's Manual] and then,
	-10 to 10V	-4000 to 4000	2.5mV	-16000 to 16000	0.625mV		confirm the I/O characteristics.
	Users range setting	4000 10 4000	0.375mV	-12000 to 12000	0.333mV		definition and the deficiency.
	0 to 20mA	0 to 4000	5μA	0 to 12000	1.66µA		
	4 to 20mA	0 10 4000	4µA	0 10 12000	1.33µA		
Current	4 to 20mA (Expanded mode)	-1000 to 4500	4μΑ	-3000 to 13500	1.33μΑ		
	Users range setting	-4000 to 4000	1.37µA	-12000 to 12000	1.33µA		
		=					
Normal resolution mode: ±4 digits							
	High res	olution mode (0	to 10V, -10 to	10V): ±16 digits		0	
	High resolution	on mode (Other	than the above	e ranges): ±12 dig	gits		
	Tempera	ature coefficient:	±71.4ppm/°C	(0.00714%/°C)			

Item	A68ADN	
Maximum conversion speed	20ms/channel	
Response time	-	
Absolute maximum input	Voltage: ±15V Current: ±30mA	
Analog input points	8 channels/module	
Maximum number of writes for E ² PROM	-	
Isolation method	Between the input terminal and programmable controller power supply: photocoupler isolation Between channels: non-isolated	
Dielectric withstand voltage	Between the I/O terminal and programmable controller power supply: 500VAC, for 1 minute	
Insulation resistance	Between the I/O terminal and programmable controller power supply: 500VDC, 5M Ω or more	
Occupied I/O points	32 points	
Occupied I/O points	(I/O assignment: special 32 points)	
Connected terminal	38-point terminal block	
Applicable wire size	0.75 to 2mm ² (Applicable tightening torque: 39 to 59N•cm)	
Applicable solderless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	
Internal current consumption (5VDC)	0.4A	
Weight	0.51kg	

O: Compatible, \triangle : Partial change required, \times : Incompatible

			3
	Q68AD-G	Compatibility	Precautions for replacement
	10ms/channel		
	(Sampling cycle)	0	
	20ms		
	Voltage: ±15V	0	
	current: ±30mA	0	
	8 channels/module	0	
	Up to 50,000 times	0	
	Between the I/O terminal and programmable controller power supply:		
	transformer isolation	0	
	Between channels: transformer isolation		
	Between the I/O terminal and programmable controller power supply:		
	500VACrms, for 1 minute	0	
	Between analog input channels: 1000VACrms, for 1 minute		
	Between the I/O terminal and programmable controller power supply:		
	500VDC, $10M\Omega$ or more	0	
	Between analog input channels: 500VDC, 10M Ω or more		
	16 points		I/O occupied points has changed to
	(I/O assignment: intelligent 16 points)	Δ	16 points.
	40-pin connector	×	
	Within 0.3mm ²	×	Wiring change is required.
	-	×	
	0.46A	Δ	The recalculation of internal current consumption [5VDC] is required.
	0.16kg	0	

2.8.2 Function comparison

 $\ensuremath{\mathsf{O}}$: With functions, -: Without functions

Item	Description	A68ADN	Q68AD-G	Precautions for replacement
A/D conversion enable/disable	Specifies whether to enable or disable the A/D conversion for each channel. By disabling the conversion for the channels that are not used, the sampling time can be shortened.	0	0	
Sampling processing	The A/D conversion for analog input values is performed successively for each channel, and the digital output value is output upon each conversion.	0	0	
Averaging processing	For each channel, A/D conversion values are averaged for the set number of times or set amount of time, and the average value is output as a digital value.	0	0	The setting range of average time and count differ. Refer to Q68AD-G [User's
	Moving average takes the average of the specified number of digital output values measured per sampling time.	-	0	Manual] and then, confirm the specifications.
Primary delay filter	A digital output value is smoothed according to the preset time constant.	-	0	
Maximum and minimum values hold function	The maximum and minimum values of the digital output values are retained in the module.	-	0	
Resolution mode	The resolution can be switched according to the application. The resolution mode is batch-set for all the channels.*1	0	0	
Input signal error detection function	The voltage/current outside the setting range is detected.	-	0	
Warning output function	 (1) Process alarm A warning is output if a digital output value falls outside the setting range. (2) Rate alarm A warning is output if the varying rate of a digital output value falls outside the preset varying rate range. 	-	0	
Scaling function	Conversion of A/D conversion values to preset percentage values and loading into the buffer memory is available. Programming steps for the scaling can be eliminated.	-	0	
Online module change	A module change is made without the system being stopped.	-	0	Replaceable modules during online are a process CPU and a redundant CPU.

For the A68ADN, the resolution for voltage and current can be set to 1/4000, 1/8000, 1/12000. For the Q68AD-G, the resolution for voltage and current is 1/4000 in the normal resolution mode, while the resolution for the voltage from -10 to 10V is 1/16000 and the resolution for the voltage in other ranges and current is 1/12000 in the high resolution mode.

2.8.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals or sequence program, refer to the Channel Isolated Analog-Digital Converter Module, Channel Isolated Analog-Digital Converter Module (With Signal Conditioning Function) User's Manual.

Device No. No. Signal name No. No. Signal name No.		A68	ADN		Q68AD-G			
No. Watchdog limer error Yo Xo Module READY Yo Yo Xo Module READY Yo Yo Xo Module READY Yo Yo Xo Yo Yo Yo Yo Y	Device	Cinnal name	Device	Cianal nama	Device	Cinnal name	Device	Cianal name
X1	No.	Signal name	No.	Signal name	No.	Signal name	No.	Signal name
X2	X0	Watchdog timer error	Y0		X0	Module READY	Y0	
X3	X1	A/D conversion READY	Y1		X1			
X4	X2	Error flag	Y2					
X4 X5 X6 X7 X8 X7 X8 X9 X9 X9 XA XA XB X9 X9 XA XA XB XD Not used YC XC XD			Y3			Not used		
X6						Not used		Not used
X7								1100 0000
X8 X9 XA XA XB XA XB XC XC XC XD XD XD XC XD XD XD XC XD XD XD XD XC XD XD XD XD XC XD	X6		Y6		X6		Y6	
X8 X9 X9 XA XA XB XB XC XC XD XD Not used XE XF X10 X11 X12 X12 X13 X14 X15 X16 X17 X18 X18 XB XA XB XA XB XB XB XB YB YB YB XB XB YB XB XB YB XB XB XB YB XB			Y7	Not used	X7	status flag		
Ya	X8		Y8	Not useu	X8		Y8	
Setting completed flag Setting request XA YA YA YA XB YB XB YB XC YC YC XD XD Not used YC XD RFRP, RTOP instruction for interlock signal when XE XF X10 Y10 Y11 X111 X12 X13 X14 X14 X15 X16 X17 X18 X19 X10 RFRP, RTOP instruction XD Not used XE Setting completed flag XB Offset/gain setting mode YA User range write request XA Offset/gain setting mode YB Channel change YC Not used Maximum value/ Maximum value/ Maximum value/ Maximum value/ Maximum value/ Maximum value/ Minimum value reset Completed flag XE A/D conversion Completed flag YF Not used XF Error flag XF Error clear request XF Error flag XF Error flag XF Error flag XF Error flag XF Error clear request XF Error flag XF Error clear request XF Error flag XF Error flag XF Error clear request XF Error flag XF Error flag XF Error clear request XF Error clear request XF Error flag XF Error flag XF Error clear request XF Error flag XF Error clear request XF Error flag XF Error flag XF Error flag XF Error flag XF Error clear request XF Error flag XF Error f	ΧQ		Va		ΧQ	Operating condition	٧a	Operating condition
YA	Λ3		13		Х		13	setting request
YE	XA		YA		XA		YA	User range write request
Not used YC	ХВ		YB		XB		YB	Channel change request
Not used YD	XC		YC		XC		YC	Not used
YE	XD	Not used	YD		XD	minimum value reset	YD	minimum value reset
Y10	XE		YE		XE		YE	Not used
X11	XF		YF		XF	Error flag	YF	Error clear request
X11			Y10	Not used				
X13								
X14				Error reset				
X15								
X16								
X17								
X18 X19 X1A X1B X1C X1D RFRP, RTOP instruction X1E for interlock signal when X1E A68ADN is used in Y18 Y19 Y14 Y18 Y19 Y1A Y1B Y1C Y1C Y1C X1D A68ADN is used in Y1F								
X19 X1A X1B X1C X1D RFRP, RTOP instruction X1E for interlock signal when X1F A68ADN is used in X1F X1A Y1B Y1A Y1B Y1C								
X1A X1B X1C X1D RFRP, RTOP instruction X1E for interlock signal when X1F A68ADN is used in X1F Not used Y1A Y1B Y1B Y1C								
X1B X1C Y1B Y1C X1D RFRP, RTOP instruction X1E for interlock signal when X1F A68ADN is used in Y1F				Not used				
X1C Y1C X1D RFRP, RTOP instruction Y1D X1E for interlock signal when Y1E A68ADN is used in Y1F								
X1D RFRP, RTOP instruction Y1D X1E for interlock signal when Y1E A68ADN is used in Y1F								
X1E for interlock signal when Y1E X1F A68ADN is used in Y1F		RFRP, RTOP instruction						
X1F A68ADN is used in Y1F								
X1F		_						
	X1F	remote I/O station	Y1F					

2.8.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs. For details of the I/O signals or sequence program, refer to the Channel Isolated Analog-Digital Converter Module, Channel Isolated Analog-Digital Converter Module (With Signal Conditioning Function) User's Manual.

	A68ADN			Q68AD-G		
Address (Dec.)	Name	Read/write	Address (Dec.)	Name	Read/write	
0	A/D conversion enable/disable setting		0	A/D conversion enable/disable		
1	Averaging processing specification		1	CH1 Average time/Average number of times/		
1	Averaging processing specification		'	Moving average/Time constant settings		
2	CH1 Averaging time, count		2	CH2 Average time/Average number of times/		
2	CTT Averaging time, count		2	Moving average/Time constant settings		
3	CH2 Averaging time, count		3	CH3 Average time/Average number of times/		
3	Criz Averaging time, count		3	Moving average/Time constant settings		
4	CH3 Averaging time, count		4	CH4 Average time/Average number of times/		
7	Cris Averaging time, count	R/W	7	Moving average/Time constant settings	R/W	
5	CH4 Averaging time, count	10,00	5	CH5 Average time/Average number of times/		
3	Cri4 Averaging time, count		3	Moving average/Time constant settings		
6	CH5 Averaging time, count		6	CH6 Average time/Average number of times/		
O	Cho Averaging time, count		O	Moving average/Time constant settings		
7	CLIC Averaging time, count		7	CH7 Average time/Average number of times/		
7	CH6 Averaging time, count		1	Moving average/Time constant settings		
0	CLIZ Averaging times assurt		0	CH8 Average time/Average number of times/	<u> </u>	
8	CH7 Averaging time, count		8	Moving average/Time constant settings		
9	CH8 Averaging time, count		9	System area (Not used)	-	
10	CH1 Digital output value		10	A/D conversion completed flag		
11	CH2 Digital output value		11	CH1 Digital output value	<u> </u>	
12	CH3 Digital output value		12	CH2 Digital output value		
13	CH4 Digital output value		13	CH3 Digital output value		
14	CH5 Digital output value	╡ _	14	CH4 Digital output value		
15	CH6 Digital output value	R	15	CH5 Digital output value	_	
16	CH7 Digital output value		16	CH6 Digital output value	R	
17	CH8 Digital output value		17	CH7 Digital output value		
18	Write data error code		18	CH8 Digital output value		
19	A/D conversion completed flag		19	Error code		
20	Resolution setting	R/W	20	Setting range (CH1 to CH4)		
		· ·	21	Setting range (CH5 to CH8)	<u> </u>	
			22	Offset/gain setting mode Offset specification		
			23	Offset/gain setting mode Gain specification	<u> </u>	
				Averaging process specification (CH1 to		
			24	CH4)	R/W	
			25	Averaging process specification (CH5 to CH8)		
			26	<u> </u>		
			27			
			28	System area (Not used)	-	
			29			
			30	CH1 Maximum value		
			31	CH1 Minimum value	†	
			32	CH2 Maximum value	†	
			33	CH2 Minimum value	†	
			34	CH3 Maximum value	R	
			to	C. To Maximum value	†	
			44	CH8 Maximum value	}	
			45	CH8 Minimum value	+	
			40	OF 10 WILLINGTO VALUE		

	Q68AD-G	
Address	Name	Read/write
(Dec.)		
46	System area (Not used)	-
47	Input signal error detection extended/input	5.44
- 10	signal error detection setting	R/W
48	Warning output setting	
49	Input signal error detection flag	_
50	Warning output flag (Process alarm)	R
51	Warning output flag (Rate alarm)	
52	System area (Not used)	-
53	Scaling enable/disable setting	R/W
54	CH1 Scaling value	
to	OUR O II	R
61	CH8 Scaling value	
62	CH1 Scaling lower limit value	
63	CH1 Scaling upper limit value	
to		
76	CH8 Scaling lower limit value	
77	CH8 Scaling upper limit value	
to		
86	CH1 Process alarm lower lower limit value	
87	CH1 Process alarm lower upper limit value	
88	CH1 Process alarm upper lower limit value	
89	CH1 Process alarm upper upper limit value	
to		
114	CH8 Process alarm lower lower limit value	
115	CH8 Process alarm lower upper limit value	
116	CH8 Process alarm upper lower limit value	
117	CH8 Process alarm upper upper limit value	R/W
118	CH1 Rate alarm warning detection period	
to		
125	CH8 Rate alarm warning detection period	
126	CH1 Rate alarm upper limit value	
127	CH1 Rate alarm lower limit value	
to		
140	CH8 Rate alarm upper limit value	
141	CH8 Rate alarm lower limit value	
	CH1 Input signal error detection setting	
142	value/CH1 Input signal error detection lower	
	limit setting value	
to	Olid land single constraint of the constraint of	
150	CH1 Input signal error detection upper limit	
	setting value	
to		
158	Mode switching setting	R/W
159		
to		D
200	Save data classification setting	R/W
201	System area (Not used)	-
202	CH1 Factory default offset value	
203	CH1 Factory default gain value	
to		R/W
232	CH8 Factory default offset value	
233	CH8 Factory default gain value	

3 ANALOG OUTPUT MODULE REPLACEMENT

3.1 List of Analog Output Module Alternative Models for Replacement

Production disco	ntinuation		Transition to Q series
Product	Model	Model	Remarks (Restrictions)
	A616DAI	Q68DAIN	1) External wiring : Cable size is changed. 2) Number of slots : Changed (2 modules are required.) 3) Program : The number of occupied I/O points, I/O signals, and buffer memory addresses are changed. 4) Performance specifications change: 8CH/module 5) Functional specifications: Not changed
	A616DAV	Q68DAVN	1) External wiring : Cable size is changed. 2) Number of slots : Changed (2 modules are required.) 3) Program : The number of occupied I/O points, I/O signals, and buffer memory addresses are changed. 4) Performance specifications change: 8CH/module 5) Functional specifications: Not changed
		Q62DAN	1) External wiring : Cable size is changed. 2) Number of slots : Not changed 3) Program : The number of occupied I/O points, I/O signals, and buffer memory addresses are changed. 4) Performance specifications change:
Analog output module	A62DA	Q64DAN	1) External wiring : Cable size is changed. 2) Number of slots : Not changed 3) Program : The number of occupied I/O points, I/O signals, and buffer memory addresses are changed. 4) Performance specifications change: Output current (minus current not applicable), I/O characteristics 5) Functional specifications: Not changed
		Q62DAN	External wiring : Cable size is changed. Number of slots : Not changed The number of occupied I/O points, I/O signals, and buffer memory addresses are changed. Performance specifications change: Not changed Functional specifications: Not changed
	A62DA-S1	Q64DAN	1) External wiring : Cable size is changed. 2) Number of slots : Not changed 3) Program : The number of occupied I/O points, I/O signals, and buffer memory addresses are changed. 4) Performance specifications change: 4CH/module 5) Functional specifications: Not changed
	A68DAI-S1	Q68DAIN	1) External wiring : Cable size is changed. 2) Number of slots : Not changed 3) Program : The number of occupied I/O points, I/O signals, and buffer memory addresses are changed. 4) Performance specifications change: Increase in current consumption 5) Functional specifications: Not changed

Production disc	ontinuation		Transition to Q series			
Product	Model	Model	Remarks (Restrictions)			
			1) External wiring : Cable size is changed.			
			2) Number of slots: : Not changed			
Analog output	A68DAV	Q68DAVN	3) Program : The number of occupied I/O points, I/O signals, and buffer memory addresses are changed.			
module			4) Performance specifications change:			
			Increase in current consumption			
			5) Functional specifications: Not changed			

⊠Point -

1. Converesion adapter

The existing wiring for the A/QnA series modules can be connected directly to the Q series modules using the upgrade tool (conversion adaptor) manufactured by Mitsubishi Electric Engineering Co., Ltd.

(1) One slot type (can be mounted on the Q series large type base unit)

Product	MELSEC-A/QnA series module	MELSEC-Q series module	Conversion adaptor	
	A62DA	Q62DAN	ERNT-AQT62DA	
	A62DA-S1	QUZDAN	LINT AGTOZBA	
Analog output module	A68DAV	Q68DAVN		
	A68DAI	Q68DAIN	ERNT-AQT68DA	
	A68DAI-S1	QUODAIN		

(2) Two slot type

(cannot be mounted on the Q series large type base unit)

Product	MELSEC-A/QnA series module	MELSEC-Q series module	Conversion adaptor	
Analog output module	A616DAV	Q68DAVN (×2 modules)	EDNT AOT616DA	
Analog output module	A616DAI	Q68DAIN (×2 modules)	ERNT-AQT616DA	

For contact information for inquiries on the upgrade tool manufactured by Mitsubishi Electric Engineering Co., Ltd., refer to Section 2.1.

2. Inrush Current

Compared to inrush current of the external power supply of the analog output unit of A/QnA series, you might inrush current of the external power supply of the Q series analog output unit is large. If an overcurrent occurs please consider the measures below.

- The rated current of the external power supply I be increased at the time of replacement.
- The power supply line is relayed by the relay, and power-on one by one.

3.2 A616DAI

3.2.1 Performance comparison

Item A616DAI	
16-bit signed binary	
Digital input (Data part: 12 bits)	
Setting range: 0 to 4095	
0 to 20mADC	
Analog output (External load resistance value: 0Ω to 600Ω)	
(External load resistance value, 052 to 60052)	
Digital input Analog output	
I/O characteristics +4000 +20mA	
+2000 +12mA	
0 4mA	
Digital value resolution 1/4000	
O contill a contraction	
Overall accuracy 0.6% (±120µA)	
(Accuracy at maximum analog When ambient temperature is 25°C: ±0.3% (±60μA)	
output value)	
Sampling period $1.5 + 0.5 \times (D/A \text{ number of conversion enabled channels}) \text{ ms}$	
Conversion time 0.5ms	
(Time required for conversion from 0 to 20mA/20mA to 0mA)	
Absolute maximum output -	
No. of analog output channels 16 channels/module	
To sharing super sharing	
Number of writes to E ² PROM -	
Output short protection -	

O: Compatible, \triangle : Partial change required, \times : Incompatible

				- · · · · · · · · · · · · · · · · ·	, — . r artial change required, *. moonipatible
	Q68DAIN			Compatibility	Precautions for replacement
`	16-bit signed binary I resolution mode: -4096 esolution mode: -12288 t	0			
(External	0 to 20mADC load resistance value: 0	Ω to 600Ω)		0	
Analog output range 0 to 20mA 4 to 20mA	Normal resolution mode Digital input value O to 4000 Normal resolution mode Maximum resolution 5µA 4µA	0			
Current User range settings	-4000 to 4000 1.5μA	-12000 to 12000	1.33µA 0.83µA	0	
	perature 25±5°C: within : erature 0 to 55°C: within	0			
	- 80µs/channel	0			
	21mA	0			
	8 channels/module	Δ	Consider replacement with multiple Q68DAIN.		
	Max. 100,000 times			0	
	Available			0	

It	em	A616DAI			
Isolation metho	od	Between the output terminal and programmable controller power supply: photocoupler isolation A616DAI channels: non-isolation			
Dielectric withs	tand voltage	-			
Insulation resis	tance	-			
Number of occupied I/O points		32 points (I/O assignment: special 32 points)			
Connected terminal		38-point terminal block			
Applicable wire	size	0.75 to 2mm ²			
Applicable solo	lerless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A			
Internal current (5VDC)	t consumption	0.3A			
Estamal	Voltage	+15VDC/-15VDC			
External	Current	+15VDC, 0.53A			
power supply	consumption	-15VDC, 0.125A			
	Inrush current	-			
Weight		0.69kg			

O: Compatible, \triangle : Partial change required, \times : Incompatible

	O . Companio	, A. I artial change required, A. Incompatible
Q68DAIN	Compatibility	Precautions for replacement
Between the I/O terminal and programmable controller power supply:		
photocoupler isolation		
Between output channels: non-isolation	0	
Between external power supply and analog output: transformer isolation		
Between the I/O terminal and programmable controller power supply:	0	
500VAC, for 1 minute	0	
Between the I/O terminal and programmable controller power supply:		
500VDC, 20M Ω or more	0	
16 points		The number of occupied I/O points
(I/O assignment: intelligent 16 points)	Δ	has changed to 16 points.
18-point terminal block	×	
0.3 to 0.75mm ²	×	
FG terminal: R1.25-3, 1.25-YS3, RAV1.25-3, V1.25-YS3A		Wiring change is required.
Terminals other than FG: R1.25-3	×	
(Sleeved solderless terminal cannot be used.)		
0.38A	Δ	The recalculation of internal current consumption (5VDC) is required.
24VDC +20%, -15%		
Ripple, spike 500mV _{P-P} or less		As the external power supply has
0.27A	×	changed from ±15V to 24V, its change is required.
2.5A 230µs or less		·
0.20kg	0	

3.2.2 Functional comparison

O: With functions, -: Without functions

Item	Description	A616DAI		Precautions for replacement
	Specifies whether to enable or disable the D/A conversion			
D/A conversion enable/	for each channel.	0	0	
disable function	By disabling the D/A conversion for the channels that are			
	not used, the conversion speed can be shortened.			0.0000 AIN //
D/A autout anable/	Specifies whether to output the D/A conversion value or the offset value for each channel.			On Q68DAIN, the output enable/disable is set with Y
D/A output enable/ disable function	The conversion speed stays constant regardless of	0	0	signal (CH□ Output enable/
disable fullction	whether D/A output is enabled or disabled.			disable flag).
	Obtains analog output synchronized with the			alousie mag).
	programmable controller CPU.			
	The analog output will be updated after Synchronous			
	output request (YD) is set to ON and the time specified as			
Synchronous output	"programmable controller CPU processing time + 120µs"			
function	has elapsed.	-	0	
	However, the analog output will be fixed to CH1, and other			
	channels (CH2 to CH8) cannot be used. When the module is mounted on a remote I/O station, the			
	analog output will not be synchronized because of a link			
	scan delay if the synchronous output function is specified.			
				Refer to ("Analog output
				status combination list" in
				the Digital-Analog
	Retains an analog value that was output when the			Converter Module User's
Analog output HOLD/	programmable controller CPU is in the STOP status or an	0	0	Manual to check the
CLEAR function	error occurs.			execution status of output. 2) For the Q68DAIN, this
				function is set with the
				intelligent function module
				switch setting.
	Outputs the analog value converted from a digital value			
	when CH□ Output enable/disable flag is forcibly turned on			
	while the programmable controller CPU is in the STOP			
Analog output test while	status.			
the programmable	D/A conversion	_	0	
controller CPU is in the	Setting enable/disable Enable Disable			
STOP status	nation CHI Output enable/disable flag Enable Disable Enable Disable			
	Not			
	Analog output test Allowed allowed Not allowed			
	Switches the resolution mode according to the application.			
Resolution mode	The resolution can be selected from 1/4000 or 1/12000.	_	0	
	The resolution mode is batch-set for all channels.			
Online module				Replaceable modules during
replacement	Replaces a module without stopping the system.	-	0	online are the Process CPU
				and the Redundant CPU.

3.2.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals and sequence program, refer to the Digital-Analog Converter Module User's Manual.

A616DAI				Q68DAIN				
Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	
X0	Watchdog timer error flag	Y0		X0	Module READY	Y0	Not used	
X1	D/A conversion READY flag	Y1		X1		Y1	CH1 Output enable/ disable flag	
X2	Error flag	Y2		X2		Y2	CH2 Output enable/ disable flag	
Х3		Y3		Х3		Y3	CH3 Output enable/ disable flag	
X4		Y4		X4	Not used	Y4	CH4 Output enable/ disable flag	
X5		Y5		X5		Y5	CH5 Output enable/ disable flag	
X6		Y6	Not used	X6		Y6	CH6 Output enable/ disable flag	
X7		Y7		X7		Y7	CH7 Output enable/ disable flag	
X8		Y8		X8	High resolution mode status flag	Y8	CH8 Output enable/ disable flag	
X9		Y9		X9	Operating condition setting completion flag	Y9	Operating condition setting request	
XA		YA		XA	Offset/gain setting mode status flag	YA	User range write request	
ХВ		YB		XB	Channel change completion flag	YB	Channel change request	
XC	Not used	YC		XC	Setting value change completion flag	YC	Setting value change request	
XD		YD	RFRP, RTOP instruction	XD	Synchronous output mode flag	YD	Synchronous output request	
XE		YE	interlock signal	XE	Not used	YE	Not used	
XF		YF		XF	Error flag	YF	Error clear request	
X10 X11		Y10 Y11						
X12		Y12						
X13		Y13						
X14 X15		Y14 Y15	Not used					
X16		Y16	Not used					
X17		Y17						
X18		Y18						
X19		Y19						
X1A		Y1A						
X1B		Y1B	Output enable batch flag					
X1C		Y1C						
X1D	RFRP, RTOP instruction	Y1D	Not used					
X1E	interlock signal	Y1E	Not used					
X1F	intoriook orgilar	Y1F						

3.2.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memories differs. For details of the buffer memories and sequence program, refer to the Digital-Analog Converter Module User's Manual.

	A616DAI	Q68DAIN				
Address	Nama	D = = d/	Address	Nome	Donal / write	
(decimal)	Name	Read/write	(decimal)	Name	Read/write	
0	D/A conversion enable/disable channel	R/W	0	D/A conversion enable/disable		
1	Analog output enable/disable channel	K/VV	1	CH1 Digital value		
2			2	CH2 Digital value		
3			3	CH3 Digital value		
4			4	CH4 Digital value	R/W	
5			5	CH5 Digital value		
6			6	CH6 Digital value		
7			7	CH7 Digital value		
8	System area (Not used)		8	CH8 Digital value		
9	System area (Not used)	-	9	System area (Not used)		
10			10	System area (Not used)	-	
11			11	CH1 Setting value check code		
12			12	CH2 Setting value check code		
13			13	CH3 Setting value check code		
14			14	CH4 Setting value check code		
15			15	CH5 Setting value check code		
16	CH0 Digital value		16	CH6 Setting value check code	R	
17	CH1 Digital value		17	CH7 Setting value check code		
18	CH2 Digital value		18	CH8 Setting value check code		
19	CH3 Digital value		19	Error code		
20	CH4 Digital value		20	Setting range (CH1 to CH4)		
21	CH5 Digital value		21	Setting range (CH5 to CH8)		
22	CH6 Digital value		22	Offset/gain setting mode		
22	Cho Digital value		22	Offset specification		
23	CH7 Digital value	R/W	23	Offset/gain setting mode	R/W	
23	CH7 Digital value	IK/VV	23	Gain specification		
24	CH8 Digital value		24	Offset/gain adjusted value specification		
25	CH9 Digital value		25			
26	CHA Digital value		26			
27	CHB Digital value		27			
28	CHC Digital value		28			
29	CHD Digital value	1	29	System area (Not used)		
30	CHE Digital value	1	30	System area (Not used)	-	
31	CHF Digital value	1	31			
32			32			
to	System area (Not used)	-	to			
47			47			

	A616DAI	Q68DAIN			
Address			Address		
(decimal)	Name	Read/write	(decimal)	Name	Read/write
48	CH0 Setting value check code		48		
49	CH1 Setting value check code		49		
50	CH2 Setting value check code		50		
51	CH3 Setting value check code		51		
52	CH4 Setting value check code		52		
53	CH5 Setting value check code		53		
54	CH6 Setting value check code		54		
55	CH7 Setting value check code	R/W	55		
56	CH8 Setting value check code	10,44	56	System area (Not used)	_
57	CH9 Setting value check code		57	Cystem area (Not asea)	
58	CHA Setting value check code		58		
59	CHB Setting value check code		59		
60	CHC Setting value check code		60		
61	CHD Setting value check code		61		
62	CHE Setting value check code		62		
63	CHF Setting value check code		63		
			to		
			157		_
			158	Mode switching setting	R/W
			159 160		
			to	System area (Not used)	
			201	Joystem area (Not useu)	_
			202	CH1 Industrial shipment settings offset value	
			203	CH1 Industrial shipment settings gain value	-
			204	CH2 Industrial shipment settings offset value	
			205	CH2 Industrial shipment settings gain value	
			206	CH3 Industrial shipment settings offset value	-
			207	CH3 Industrial shipment settings gain value	
			208	CH4 Industrial shipment settings offset value	
			209	CH4 Industrial shipment settings gain value	
			210	CH5 Industrial shipment settings offset value	
			211	CH5 Industrial shipment settings gain value	
			212	CH6 Industrial shipment settings offset value	
			213	CH6 Industrial shipment settings gain value	
			214	CH7 Industrial shipment settings offset value	
			215	CH7 Industrial shipment settings gain value	
			216	CH8 Industrial shipment settings offset value	
			217	CH8 Industrial shipment settings gain value	R/W
			218	CH1 User range settings offset value	
			219	CH1 User range settings gain value	
			220	CH2 User range settings offset value	
			221	CH2 User range settings gain value	
			222	CH3 User range settings offset value	-
			223	CH3 User range settings gain value	-
			224 225	CH4 User range settings offset value	-
			225	CH4 User range settings gain value CH5 User range settings offset value	-
			227	CH5 User range settings onset value	-
			228	CH6 User range settings offset value	-
			229	CH6 User range settings onset value	-
			230	CH7 User range settings offset value	-
			231	CH7 User range settings driset value	-
			232	CH8 User range settings offset value	-
			232	CHR User range settings gain value	1

233

CH8 User range settings gain value

3.3 A616DAV

3.3.1 Performance comparison

Item			A616DAV						
		16-bit sic	ned binary (Data	part: 12 bits	s)				
Digital input		A616DAV							
	When output voltage range setting is 10V:								
			-10V to 0V to +1	10V					
Analog output	(External load resistance value: $2k\Omega$ to $1M\Omega$)								
Analog output		When out	tput voltage range	e setting is 5	5V:				
			-5V to 0V to +5	5V					
	(I	External lo	ad resistance valu	ue: $2k\Omega$ to 1	ΜΩ)				
		igital input	Analog	output					
					ng				
I/O characteristics									
	<u> </u>								
	 	_							
	 -								
Distal color acceletion			4/4000						
Digital value resolution	Outrout walks as a series a setting				EV/				
Overall accuracy		_				_			
(accuracy at maximum analog	· · · · · · · · · · · · · · · · · · ·	, , , , , , , , , , , , , , , , , , , ,							
output value)									
Sampling period	1.5 + 0.5	^ (D/A Hui		ili ellableu c	channels) his				
Conversion time	(Time red	auired for a		10 to +10V/	+10 to -10V)				
Absolute maximum output	(Time rec	quired for c		10 10 1 10 17	10.00 100)				
No. of analog output channels			16 channels/mod	dule					
Number of writes to E ² PROM			-						
Output short protection			-						
Isolation method	Between the output termin		-		supply: photocoupler isolation				
		A616I	DAV channels: no	n-isolation					
Dielectric withstand voltage			_						
Insulation resistance			-						
Number of occupied I/O points		(1/0 ==	32 points	I 22 nainta\					
Connected terminal			ssignment: specia						
Applicable wire size		<u> </u>	0.75 to 2mm ²						
Applicable Wile SIZE			U.73 IU ZIIIM			-			
Applicable solderless terminal		V1.25-3,	V1.25-YS3A, V2-	S3, V2-YS3	3A				
Internal current consumption			0.38A						
(5VDC)			3.00.						

O : Compatible, \triangle : Partial change required, \star : Incompatible

1							,∆: Partial change required, ×: Incompatible
			Q68DAVN			Compatibility	Precautions for replacement
1		16-bit					
	•	Normal resoluti	0				
	High resol	lution mode: -1	2288 to 12287	7, -16384 to 1638	3)		
-10 to 10VDC (External load resistance value: $1k\Omega$ to $1M\Omega$)							
Ana	la a cutaut	Normal reso	olution mode	High resolut	ion mode		
11	log output range	Digital input	Maximum	Digital input	Maximum		When using A616DAVN in [-5 to + 5V]
	range	value	resolution	value	resolution		range, Q68DAV can obtain equivalent
	0 to 5V	0 to 4000	1.25mV	0 to 12000	0.416mV	0	resolution or more than A616DAV by
	1 to 5V	0 10 4000	1.0mV	0 10 12000	0.333mV		setting in [-10 to 10V] range/ high
Voltage	-10 to 10V		2.5mV	-16000 to 16000	0.625mV		resolution mode or user range.
	User range settings	-4000 to 4000	0.75mV	-12000 to 12000	0.333mV		
-				0			
	Ambiont	t tomporaturo	05±5°C+ Withir	n ±0.1% (±10mV)			
		•		in ±0.3% (±30mV		0	
	Ambient	temperature o	to 55 C. With	III ±0.3% (±30IIIV)		
			-				
80µs/channel						0	
			±12V			0	
		8 cha	innels/module			Δ	Consider replacement with multiple Q68DAVN.
		Max.	100,000 times	3		0	
			Available			0	
D.	atwoon the I/O			controller power	oupply:		
	В	photoc Between output	oupler isolatio channels: no	n		0	
		terminal and		controller power		0	
В	etween the I/C	terminal and		e controller power	supply:	0	
16 points (I/O assignment: intelligent 16 points)						Δ	The number of occupied I/O points has changed to 16 points.
<u> </u>			nt terminal bloc			×	<u> </u>
			to 0.75mm ²			×	
	FG termina	al: R1.25-3, 1.2		I.25-3, V1.25-YS3 R1.25-3	3A	×	Wiring change is required.
	(Sle	eved solderles	s terminal can	not be used.)			
			0.38A			0	

Item		A616DAV	
Futomal	Voltage	+15VDC / -15VDC	
External	Current	+15VDC, 0.2A	
power supply	consumption	-15VDC, 0.17A	
	Inrush current	-	
Weight		0.65kg	

 $O: Compatible, \triangle: Partial \ change \ required, \ \times: Incompatible$

Q68DAVN	Compatibility	Precautions for replacement
24VDC +20%, -15% Ripple, spike 500mV _{P-P} or less		As the external power supply has
0.20A		changed from ±15V to 24V, its change is required.
2.5A, 230µs or less		
0.20kg	0	

3.3.2 Functional comparison

O: With functions, -: Without functions

Item	Description	A616DAV		Precautions for replacement
D/A conversion	Specifies whether to enable or disable the D/A conversion			
enable/disable	for each channel. By disabling the D/A conversion for the	0	0	
function	channels that are not used, the conversion speed can be		0	
Turicuori	shortened.			
	Specifies whether to output the D/A conversion value or the			On Q68DAVN, the output
D/A output enable/	offset value for each channel.	0	0	enable/disable is set with Y
disable function	The conversion speed stays constant regardless of			signal (CH□ Output enable/
	whether D/A output is enabled or disabled.			disable flag).
	Obtains analog output synchronized with the			
	programmable controller CPU.			
	The analog output will be updated after Synchronous			
	output request (YD) is set to ON and the time specified as			
Synchronous output	"programmable controller CPU processing time + 120μs"		_	
function	has elapsed.	-	0	
	However, the analog output will be fixed to CH1, and other			
	channels (CH2 to CH8) cannot be used.			
	When the module is mounted on a remote I/O station, the			
	analog output will not be synchronized because of a link			
	scan delay if the synchronous output function is specified.			Refer to ("Analog output
Analog output HOLD/ CLEAR function	Retains an analog value that was output when the programmable controller CPU is in the STOP status or an error occurs.	0	0	status combination list" in the Digital-Analog Converter Module User's Manual to check the execution status of output. 2) For the Q68DAVN, this function is set with the intelligent function module switch setting.
Analog output test while the programmable controller CPU is in the STOP status	Outputs the analog value converted from a digital value when CH□ Output enable/disable flag is forcibly turned on while the programmable controller CPU is in the STOP status. Setting	-	0	
	Analog output test Allowed Not allowed Not allowed			
Resolution mode	Switches the resolution mode according to the application. The resolution can be selected from 1/4000, 1/12000, or 1/16000. The resolution mode is batch-set for all channels.	-	0	
Online module replacement	Replaces a module without stopping the system.	-	0	Replaceable modules during online are the Process CPU and the Redundant CPU.

3.3.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals and sequence program, refer to the Digital-Analog Converter Module User's Manual.

A616DAV				Q68DAVN				
Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	
X0	Watchdog timer error flag	Y0		X0	Module READY	Y0	Not used	
X1	D/A conversion READY flag	Y1		X1		Y1	CH1 Output enable/ disable flag	
X2	Error flag	Y2		X2		Y2	CH2 Output enable/ disable flag	
Х3		Y3		Х3		Y3	CH3 Output enable/ disable flag	
X4		Y4		X4	Not used	Y4	CH4 Output enable/ disable flag	
X5		Y5		X5		Y5	CH5 Output enable/ disable flag	
X6		Y6	Not used	X6		Y6	CH6 Output enable/ disable flag	
X7		Y7		X7		Y7	CH7 Output enable/ disable flag	
X8		Y8		X8	High resolution mode status flag	Y8	CH8 Output enable/ disable flag	
X9		Y9		X9	Operating condition setting completion flag	Y9	Operating condition setting request	
XA		YA		XA	Offset/gain setting mode status flag	YA	User range write request	
ХВ		YB		XB	Channel change completion flag	YB	Channel change request	
XC	Not used	YC		XC	Setting value change completion flag	YC	Setting value change request	
XD		YD	RFRP, RTOP instruction	XD	Synchronous output mode flag	YD	Synchronous output request	
XE		YE	interlock signal	XE	Not used	YE	Not used	
XF		YF		XF	Error flag	YF	Error clear request	
X10		Y10						
X11		Y11						
X12		Y12						
X13 X14		Y13 Y14						
X14 X15		Y15	Not used					
X16		Y16	Not asca					
X17		Y17						
X18		Y18						
X19		Y19						
X1A		Y1A						
X1B		Y1B	Output enable batch flag					
X1C		Y1C						
X1D	RFRP, RTOP instruction	Y1D	Not used					
X1E	interlock signal	Y1E	INOLUSEU					
X1F	interiock signal	Y1F						

3.3.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memories differs. For details of the buffer memories and sequence program, refer to the Digital-Analog Converter Module User's Manual.

	A616DAV	Q68DAVN				
Address (decimal)	Name	Read/write	Address (decimal)	Name	Read/write	
0	D/A conversion enable/disable channel		0	D/A conversion enable/disable		
1	Analog output enable/disable channel	R/W	1	CH1 Digital value		
2			2	CH2 Digital value	_	
3			3	CH3 Digital value		
4			4	CH4 Digital value	R/W	
5			5	CH5 Digital value		
6			6	CH6 Digital value		
7			7	CH7 Digital value		
8			8	CH8 Digital value		
9	System area (Not used)	-	9			
10			10	System area (Not used)	-	
11			11	CH1 Setting value check code		
12			12	CH2 Setting value check code		
13			13	CH3 Setting value check code	-	
14			14	CH4 Setting value check code		
15			15	CH5 Setting value check code		
16	CH0 Digital value		16	CH6 Setting value check code	R	
17	CH1 Digital value		17	CH7 Setting value check code		
18	CH2 Digital value		18	CH8 Setting value check code		
19	CH3 Digital value		19	Error code		
20	CH4 Digital value		20	Setting range (CH1 to CH4)		
21	CH5 Digital value		21	Setting range (CH5 to CH8)		
22	CHC Digital value		22	Offset/gain setting mode		
22	CH6 Digital value		22	Offset specification		
23	CH7 Digital value	R/W	23	Offset/gain setting mode	R/W	
23	CH7 Digital value	IK/VV	23	Gain specification		
24	CH8 Digital value		24	Offset/gain adjusted value specification		
25	CH9 Digital value		25			
26	CHA Digital value		26			
27	CHB Digital value		27			
28	CHC Digital value		28			
29	CHD Digital value		29	System area (Not used)		
30	CHE Digital value		30	System area (Not used)	_	
31	CHF Digital value		31			
32			32			
to	System area (Not used)	-	to			
47			47			

3 ANALOG OUTPUT MODULE REPLACEMENT

	A616DAV			Q68DAVN				
Address			Address					
(decimal)	Name	Read/write	(decimal)	Name	Read/write			
48	CH0 Setting value check code		48					
49	CH1 Setting value check code		1	1		49		
50	CH2 Setting value check code		50					
51	CH3 Setting value check code		51					
52	CH4 Setting value check code		52					
53	CH5 Setting value check code		53					
54	CH6 Setting value check code		54					
55	CH7 Setting value check code	R/W	55					
56	CH8 Setting value check code	IVVV	56	System area (Not used)	_			
57	CH9 Setting value check code		57	Cystem area (Not useu)				
58	CHA Setting value check code		58					
59	CHB Setting value check code		59					
60	CHC Setting value check code		60					
61	CHD Setting value check code		61					
62	CHE Setting value check code		62					
63	CHF Setting value check code		63					
			to					
			157					
			158	Mode switching setting	R/W			
			159	3 3				
			160					
			to	System area (Not used)	-			
			201					
			202	CH1 Industrial shipment settings offset value	-			
			203	CH1 Industrial shipment settings gain value	-			
			204	CH2 Industrial shipment settings offset value	-			
			205	CH2 Industrial shipment settings gain value	-			
			206	CH3 Industrial shipment settings offset value	-			
			207	CH3 Industrial shipment settings gain value	-			
			209	CH4 Industrial shipment settings offset value CH4 Industrial shipment settings gain value				
			210	CH5 Industrial shipment settings gain value				
			210	CH5 Industrial shipment settings onset value				
			212	CH6 Industrial shipment settings gain value	1			
			213	CH6 Industrial shipment settings onset value				
			214	CH7 Industrial shipment settings gain value	-			
			215	CH7 Industrial shipment settings onset value				
			216	CH8 Industrial shipment settings offset value				
			217	CH8 Industrial shipment settings gain value				
			218	CH1 User range settings offset value	R/W			
			219	CH1 User range settings gain value	†			
			220	CH2 User range settings offset value	-			
			221	CH2 User range settings gain value	-			
			222	CH3 User range settings offset value	-			
			223	CH3 User range settings gain value	-			
			224	CH4 User range settings offset value	1			
			225	CH4 User range settings gain value	1			
			226	CH5 User range settings offset value	1			
			227	CH5 User range settings gain value	1			
			228	CH6 User range settings offset value				
			229	CH6 User range settings gain value	1			
			230	CH7 User range settings offset value				
					1			
			231	CH7 User range settings gain value				
			231	CH7 User range settings gain value CH8 User range settings offset value				

3.4 A62DA (Replacement to the Q62DAN)

3.4.1 Performance comparison

Item	A62DA								
Digital input	Maximum setting value Voltage: ±2000 Current: ±1000								
Analog output	Voltage: -10 to 0 to +10VDC (External load resistance value: 500Ω to $1M\Omega$)								
I/O characteristics	Digital input Analog output Voltage Current +2000 +10V - +1000 +5V +20mA 0 0V +4mA -1000 -5V -12mA -2000 -10V -								
Maximum resolution	Voltage: 5mV (1/2000) Current: 20μΑ (1/1000)								
Overall accuracy (accuracy at maximum analog output value)	±1% (voltage: ±0.1V, current: ±0.2mA)								
Maximum conversion speed	Within 15ms/2 channels (same time for one channel) Note) Time from when the digital input is written to when the specified analog voltage (current) is reached								
Absolute maximum output	Voltage: ±12V Current: ±28mA Note) Max. output voltage and current restricted by output protection circuit								
Number of analog output points	2 channels/module								
Number of writes to E ² PROM	-								
Output short protection	-								

O: Compatible, △: Partial change required, ×: Incompatible

		000	DAN					△ : Partial change required, ×: Incompatible
Hig	Normal gh resolution i	16-bit sig			Compatibility △	According to the I/O conversion characteristics used, make the output range setting and offset/gain setting of the Q62DAN.		
	·	Voltage: -1 oad resistal Current: 0 oad resista	nce value: to 20mAD		0	The minus current cannot be output.		
Voltage	output range 0 to 5V 1 to 5V -10 to 10V User range settings 0 to 20mA 4 to 20mA User range settings	Normal r mc Digital input value 0 to 4000 -4000 to 4000 0 to 4000 -4000 to 4000		High res mod Digital input value 0 to 12000 -16000 to 16000 -12000 to 12000 -12000 to 12000 -12000 to 12000	de		Δ	According to the I/O conversion characteristics used, make the output range setting and offset/gain setting of the Q62DAN.
Ambient temperature 25±5°C: within ±0.1% (voltage: ±10mV, current: ±20μA) Ambient temperature 0 to 55°C: within ±0.3% (voltage: ±30mV, current: ±60μA)							0	
80µs/channel							0	
Voltage: ±12V Current: 21mA							Δ	The minus current cannot be output.
			els/module				0	
),000 times iilable	·			0	
		Ava	IIIGDIC				O	

Ite	em	A62DA					
Isolation metho	od	Between the output terminal and programmable controller power supply: photocoupler isolation (Between channels: non-isolation)					
Dielectric withs	tand voltage	-					
Insulation resis	tance	-					
Number of occ	upied I/O points	32 points (I/O assignment: special 32 points)					
Connected terr	minal	20-point terminal block					
Applicable wire	e size	0.75 to 2mm ² (Applicable tightening torque: 39 to 59N•cm)					
Applicable sold	lerless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A					
Internal current (5VDC)	t consumption	0.6A					
External	Voltage	21.6 to 26.4VDC					
power supply	Current consumption	0.35A					
	Inrush current	2.4A					
Weight		0.5kg					

O : Compatible, △ : Partial change required, ×: Incompatible

	○. Compatible,△. Fartial change required, *. Incompatible				
Q62DAN	Compatibility	Precautions for replacement			
Between the I/O terminal and programmable controller power supply:					
photocoupler isolation					
Between output channels: non-isolation					
Between external power supply and analog output: transformer isolation					
Between the I/O terminal and programmable controller power supply:					
500VAC, for 1 minute					
Between the I/O terminal and programmable controller power supply:					
500VDC, 20M Ω or more	O				
16 points		The number of occupied I/O points			
(I/O assignment: intelligent 16 points)		has changed to 16 points.			
18-point terminal block	×				
0.3 to 0.75mm ²	×	Wiring change is required.			
R1.25-3					
(Sleeved solderless terminal cannot be used.)	*				
0.33A	0				
24VDC +20%, -15%	0				
Ripple, spike 500mV _{P-P} or less	Ŭ				
0.15A	0				
2.5A, 250µs or less	0				
0.19kg	0				
	Between the I/O terminal and programmable controller power supply:	Q62DAN Compatibility Between the I/O terminal and programmable controller power supply: photocoupler isolation Between output channels: non-isolation Between external power supply and analog output: transformer isolation Between the I/O terminal and programmable controller power supply: 500VAC, for 1 minute O Between the I/O terminal and programmable controller power supply: 500VDC, 20MΩ or more O 16 points Δ (I/O assignment: intelligent 16 points) Δ R1.25-3 × (Sleeved solderless terminal cannot be used.) × 0.33A O 24VDC +20%, -15% O Ripple, spike 500mV _{P-P} or less O 0.15A O 2.5A, 250µs or less O			

3.4.2 Functional comparison

O: Available, -: Not available

Item	Description	A62DA	Q62DAN	Precautions for replacement
Analog output HOLD/CLEAR function	Retains an analog value that was output when the programmable controller CPU is in the STOP status or an error occurs.	-	0	
D/A conversion enable/disable function	Specifies whether to enable or disable the D/A conversion.	-	0	
D/A output enable/disable function	Specifies whether to output the D/A conversion value or the offset value.	0	0	The Q62DAN specifies whether to enable or disable output for each channel.
Synchronous output function	Obtains analog output synchronized with the programmable controller CPU.	-	0	
Analog output test while the programmable controller CPU is in the STOP status	Outputs the analog value converted from a digital value when CH Output enable/ disable flag is forcibly turned on while the programmable controller CPU is in the STOP status.	1	0	
Resolution mode	Switches the resolution mode according to the application. The resolution can be selected from 1/4000, 1/12000, or 1/16000. The resolution mode is batch-set for all channels.	-	0	
Online module replacement	Replaces a module without stopping the system.	-	0	Replaceable modules during online are the Process CPU and the Redundant CPU.

3.4.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals and sequence program, refer to the Digital-Analog Converter Module User's Manual.

	A62		Q62DAN					
Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	
X0	Watchdog timer error	Y0		X0	Module READY	Y0	Not used	
X1	D/A conversion READY	Y1		X1		Y1	CH1 Output enable/	
	<i>57</i> (6611 6161 1 1 1 2 1 2 1						disable flag	
X2		Y2		X2		Y2	CH2 Output enable/	
X3		Y3		X3	Notuced	Y3	disable flag	
X3 X4		Y4		X3 X4	Not used	Y4		
X5		Y5		X5		Y5		
X6		Y6		X6		Y6	Not used	
X7		Y7		X7		Y7		
					High resolution mode			
X8		Y8		X8	status flag	Y8		
X9		Y9		X9	Operating condition	Y9	Operating condition	
79		19		79	setting completion flag	19	setting request	
XA		YA		XA	Offset/gain setting mode	YA	User range write request	
701			Not used		status flag	.,,	- Coor range with request	
XB		YB		XB	Channel change	YB	Channel change request	
					completion flag		0 111	
XC		YC		XC	Setting value change	YC	Setting value change	
					completion flag Synchronous output		request Synchronous output	
XD	Not used	YD		XI)	mode flag	YD	request	
XE	1100 0000	YE		XE	Not used	YE	Not used	
XF		YF		XF	Error flag	YF	Error clear request	
X10		Y10			, ,			
X11		Y11						
X12		Y12						
X13		Y13						
X14		Y14						
X15		Y15						
X16		Y16						
X17 X18		Y17 Y18	CDI I colontina cinad					
X10 X19		Y19	CPU selection signal Sign of CH1 digital input					
X19 X1A	-	Y1A	Sign of CH2 digital input					
X1B		Y1B	Output enable					
X1C	1	Y1C						
X1D		Y1D	Matriaga					
X1E	1	Y1E	Not used					
X1F		Y1F						

3.4.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs. For details of the buffer memories and sequence program, refer to the Digital-Analog Converter Module User's Manual.

	A62DA		Q62DAN				
Address	Name	Read/write	Address	Name	Read/write		
(decimal)		iteau/wiite	(decimal)	Name	ixeau/write		
0	CH1 Digital value		0	D/A conversion enable/disable			
1	CH2 Digital value		1	CH1 Digital value	R/W		
2	CH1 Voltage setting value check code	R/W	2	CH2 Digital value			
3	CH2 Voltage setting value check code		3				
4	CH1 Current setting value check code		4				
5	CH2 Current setting value check code		5	System area (Not used)	-		
			to				
			10				
			11	CH1 Setting value check code	R		
			12	CH2 Setting value check code	.,		
			13				
			to	System area (Not used)	-		
			18				
			19	Error code	R		
			20	Setting range (CH1 to CH2)			
			21	System area (Not used)	-		
			22	Offset/gain setting mode			
				Offset specification			
			23	Offset/gain setting mode	R/W		
				Gain specification			
			24	Offset/gain adjusted value specification			
			25				
			to	System area (Not used)	-		
			157				
			158	Mode switching setting	R/W		
			159	g			
			160				
			to	System area (Not used)	-		
			199				
			200	Pass data classification setting	R/W		
			201	System area (Not used)	-		
			202	CH1 Industrial shipment settings offset value			
			203	CH1 Industrial shipment settings gain value			
			204	CH2 Industrial shipment settings offset value			
			205	CH2 Industrial shipment settings gain value	R/W		
			206	CH1 User range settings offset value			
			207	CH1 User range settings gain value			
			208	CH2 User range settings offset value			
			209	CH2 User range settings gain value			

3 ANALOG OUTPUT MODULE REPLACEMENT

Memo		

3.5 A62DA (Replacement to the Q64DAN)

3.5.1 Performance comparison

Item	A62DA							
Digital input	Maximum setting value Voltage: ±2000 Current: ±1000							
Analog output	Voltage: -10 to 0 to +10VDC (External load resistance value: 500Ω to $1M\Omega$)							
I/O characteristics	Digital input Analog output Voltage Current +2000 +10V +1000 +5V 0 0V -1000 -5V -2000 -10V							
Maximum resolution	Voltage: 5mV (1/2000) Current: 20μA (1/1000)							
Overall accuracy (accuracy at maximum analog output value)	±1% (voltage: ±0.1V, current: ±0.2mA)							
Maximum conversion speed	Within 15ms/2 channels (same time for one channel) Note) Time from when the digital input is written to when the specified analog voltage (current) is reached							
Absolute maximum output	Voltage: ±12V Current: ±28mA Note) Max. output voltage and current restricted by output protection circuit							
Number of analog output points	2 channels/module							
Number of writes to E ² PROM	-							
Output short protection	-							

								•	\triangle : Partial change required, \times : Incompatible
			Q64	4DAN				Compatibility	Precautions for replacement
	Hig	(Normal h resolution r	resolution			Δ	According to the I/O conversion characteristics used, make the output range setting and offset/gain setting of the Q64DAN.		
		·	Voltage: -1 oad resistal Current: 0 load resista	nce value: to 20mAD		0	The minus current cannot be output.		
				esolution ode	High res				
	Analog	output range	Digital input value	Maximum resolution	Digital input value	resolution			
		0 to 5V 1 to 5V	0 to 4000	1.25mV 1.0mV	0 to 12000	0.416mV 0.333mV		Δ	According to the I/O conversion
	Voltage	-10 to 10V	-4000 to	2.5mV	-16000 to 16000	0.625mV			characteristics used, make the output range setting and offset/gain setting
		User range settings		0.75mV	-12000 to 12000	0.333mV			of the Q64DAN.
	Current	0 to 20mA 4 to 20mA	0 to 4000	5 μ A 4 μ A	0 to 12000	1.66μA 1.33μA			
		User range settings	-4000 to 4000	1.5 <i>µ</i> A	-12000 to 12000	0.83 μ A			
	Ambient temperature 25±5°C: within ±0.1% (voltage: ±10mV, current: ±20μA) Ambient temperature 0 to 55°C: within ±0.3% (voltage: ±30mV, current: ±60μA)								
	80μs/channel							0	
	Voltage: ±12V Current: 21mA							Δ	The minus current cannot be output.
			4 channe	els/module				0	
				0,000 times				0	
			Ava	ilable				0	

Ite	em	A62DA					
Isolation metho	od	Between the output terminal and programmable controller power supply: photocoupler isolation (Between channels: non-isolation)					
Dielectric withs	tand voltage	-					
Insulation resis	tance	-					
Number of occ	upied I/O points	32 points (I/O assignment: special 32 points)					
Connected terr	minal	20-point terminal block					
Applicable wire	e size	0.75 to 2mm ² (Applicable tightening torque: 39 to 59N•cm)					
Applicable sold	lerless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A					
Internal current (5VDC)	t consumption	0.6A					
External	Voltage	21.6 to 26.4VDC					
power supply	Current consumption	0.35A					
	Inrush current	2.4A					
Weight		0.5kg					

O: Compatible, △: Partial change required, ×: Incompatible

		O: Compatible, △: Partial change required, *: incompatible		
	Q64DAN	Compatibility	Precautions for replacement	
	Between the I/O terminal and programmable controller power supply:			
	photocoupler isolation			
	Between output channels: non-isolation	0		
	Between external power supply and analog output: transformer isolation			
	Between the I/O terminal and programmable controller power supply:	0		
	500VAC, for 1 minute			
	Between the I/O terminal and programmable controller power supply:	0		
	500VDC, 20M Ω or more			
	16 points	^	The number of occupied I/O points	
	(I/O assignment: intelligent 16 points)	Δ	has changed to 16 points.	
	18-point terminal block	×		
	0.3 to 0.75mm ²	×	Wiring change is required.	
	R1.25-3 (Sleeved solderless terminal cannot be used.)	×		
	0.34A	0		
	24VDC +20%, -15%	_		
	Ripple, spike 500mV _{P-P} or less	0		
	0.24A	0		
	2.5A, 260µs or less	0		
	0.20kg	0		

3.5.2 Functional comparison

O: Available, -: Not available

Item	Description	A62DA	Q64DAN	Precautions for replacement
Analog output HOLD/CLEAR function	Retains an analog value that was output when the programmable controller CPU is in the STOP status or an error occurs.	-	0	
D/A conversion enable/disable function	Specifies whether to enable or disable the D/A conversion.	-	0	
D/A output enable/disable function	Specifies whether to output the D/A conversion value or the offset value.	0	0	The Q64DAN specifies whether to enable or disable output for each channel.
Synchronous output function	Obtains analog output synchronized with the programmable controller CPU.	-	0	
Analog output test while the programmable controller CPU is in the STOP status	Outputs the analog value converted from a digital value when CH□ Output enable/ disable flag is forcibly turned on while the programmable controller CPU is in the STOP status.	-	0	
Resolution mode	Switches the resolution mode according to the application. The resolution can be selected from 1/4000, 1/12000, or 1/16000. The resolution mode is batch-set for all channels.	-	0	
Online module replacement	Replaces a module without stopping the system.	-	0	Replaceable modules during online are the Process CPU and the Redundant CPU.

3.5.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals and sequence program, refer to the Digital-Analog Converter Module User's Manual.

A62DA			Q64DAN				
Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	Device No.	Signal name
X0	Watchdog timer error	Y0		X0	Module READY	Y0	Not used
X1	D/A conversion READY	Y1		X1		Y1	CH1 Output enable/
							disable flag
X2		Y2		X2		Y2	CH2 Output enable/ disable flag
							CH3 Output enable/
Х3		Y3		Х3	Not used	Y3	disable flag
X4		Y4		X4		Y4	CH4 Output enable/
		>/5				\/F	disable flag
X5 X6		Y5 Y6		X5 X6		Y5 Y6	
X7		Y7		X7		Y7	Not used
					High resolution mode		1100 0000
X8		Y8		X8	status flag	Y8	
X9		Y9		X9	Operating condition	Y9	Operating condition
7.0				Λ0	setting completion flag	10	setting request
XA		YA	Not used	XA	Offset/gain setting mode status flag	YA	User range write request
XB		YB		XB	Channel change	YB	Channel change request
					completion flag		
XC		YC		XC	Setting value change completion flag	YC	Setting value change
	Not used				Synchronous output		request Synchronous output
XD	Thor dood	YD		XD	mode flag	YD	request
XE		YE		XE	Not used	YE	Not used
XF		YF		XF	Error flag	YF	Error clear request
X10		Y10					
X11		Y11					
X12 X13		Y12 Y13					
X13		Y14					
X15		Y15					
X16		Y16					
X17		Y17					
X18			CPU selection signal				
X19		Y19	Sign of CH1 digital input				
X1A		Y1A	Sign of CH2 digital input				
X1B X1C		Y1B Y1C	Output enable				
X1C X1D	1	Y1D					
X1E		Y1E	Not used				
X1F		Y1F					

3.5.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs. For details of the buffer memories and sequence program, refer to the Digital-Analog Converter Module User's Manual.

	A62DA			Q64DAN	
Address (decimal)	Name	Read/write	Address (decimal)	Name	Read/write
0	CH1 Digital value		0	D/A conversion enable/disable	
1	CH2 Digital value		1	CH1 Digital value	
2	CH1 Voltage setting value check code		2	CH2 Digital value	R/W
3	CH2 Voltage setting value check code	R/W	3	CH3 Digital value	
4	CH1 Current setting value check code		4	CH4 Digital value	
5	CH2 Current setting value check code		5		
		<u> </u>	to	System area (Not used)	-
			10		
			11	CH1 Setting value check code	
			12	CH2 Setting value check code	_
			13	CH3 Setting value check code	R
			14	CH4 Setting value check code	
			15	-	
			to	System area (Not used)	-
			18	. ,	
			19	Error code	
			20	Setting range (CH1 to CH4)	R
			21	System area (Not used)	-
			20	Offset/gain setting mode	
			22	Offset specification	
			22	Offset/gain setting mode	R/W
			23	Gain specification	
			24	Offset/gain adjusted value specification	
			25		
			to	System area (Not used)	-
			157		
			158	Mode awitching actting	R/W
			159	Mode switching setting	IN/VV
			160		
			to	System area (Not used)	-
			199		
			200	Pass data classification setting	R/W
			201	System area (Not used)	-
			204	CH2 Industrial shipment settings offset value	
			205	CH2 Industrial shipment settings gain value	
			206	CH3 Industrial shipment settings offset value	
			207	CH3 Industrial shipment settings gain value	
			208	CH4 Industrial shipment settings offset value	
			209	CH4 Industrial shipment settings gain value	
			210	CH1 User range settings offset value	R/W
			211	CH1 User range settings gain value	
			212	CH2 User range settings offset value	
			213	CH2 User range settings gain value	
			214	CH3 User range settings offset value	
			215	CH3 User range settings gain value	
			216	CH4 User range settings offset value	
			217	CH4 User range settings gain value	Ì

3 ANALOG OUTPUT MODULE REPLACEMENT MELSEC

Memo		

3.6 A62DA-S1 (Replacement to the Q62DAN)

3.6.1 Performance comparison

It	tem	A62I	A-S1				
Digital input		0 to -	4000				
Analog output		Voltage: 0 to +10VDC (External load resistance value: 500Ω to $1M\Omega$) Current: +4 to +20mADC (External load resistance value: 0Ω to 600Ω) *Current output is usable by 0 to +20mA.					
I/O characteris	stics	Output range Digital inp	+ 5V 0V + 5V	ellog output + 10V 0V or + 20mA / or 0mA or + 20mA / or + 4mA			
Maximum	Voltage	1 to 5V: 1n 0 to 5V: 1.25 0 to 10V: 2.5	mV (1/4000	0)			
resolution	Current	4 to 20mA: 4 0 to 20mA: 4		•			
Overall accura (accuracy at n output value)	acy naximum analog	(Refer to *1.)					
Maximum con	version speed	Within 15ms/2 channels (s Note) Time from when the digital input is written to w			,		
Absolute maximum output		Voltage: 0 to +12V Current: 0 to +28mA Note) Max. output voltage and current restricted by output protection circuit					
Number of and points	alog output	2 channe	ls/module	-			
Number of wri	tes to E ² PROM						
Catput onort p	i o to o ti o i i						

^{*1} Indicates accuracy at the maximum analog output value of the A62DA-S1.

Output range Temperature range	1 to 5V	0 to 5V	0 to 10V	4 to 20mA	0 to 20mA
25°C(within ± 0.5%)	±25mV	±25mV	±50mV	±0.1mA	±0.1mA
0 to 55°C (within ±1%)	±50mV	±50mV	±100mV	±0.2mA	±0.2mA

O: Compatible, \triangle : Partial change required, \times : Incompatible

			O: Compatible,	O: Compatible, △: Partial change required, ×: Incompatible			
		Q62	2DAN			Compatibility	Precautions for replacement
Hig	Normal h resolution r	resolution r		0			
_	-10 to 10VDC 0 to 20mADC			0			
Analog Voltage Current	User range settings	Digital input value 0 to 4000 -4000 to 4000 0 to 4000 -4000 to 4000 -4000 to 4000	esolution ode Maximum resolution 1.25mV 1.0mV 2.5mV 0.75mV 5 \(\mu \) A 4 \(\mu \) A 1.5 \(\mu \) A	High res mo Digital input value 0 to 12000 -16000 to 16000 -12000 to 12000 0 to 12000 -12000 to 12000	de	0	
	(volt Ambient te	emperature age: ±10m\ emperature age: ±30m\	0				
		80µs/	channel	0			
Voltage: ±12V Current: 21mA						0	
		2 channe	els/module	0			
		Max. 100	0,000 times	;		0	
		Ava	ailable			0	

It	em	A62DA-S1					
Isolation method		Between the output terminal and programmable controller power supply: photocoupler isolation (Between channels: non-isolation)					
Dielectric withs	stand voltage	-					
Insulation resis	stance	-					
Number of occ	upied I/O points	32 points (I/O assignment: special 32 points)					
Connected terr	minal	20-point terminal block					
Applicable wire	e size	0.75 to 2mm ² (Applicable tightening torque: 39 to 59N•cm)					
Applicable solo	derless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A					
Internal current (5VDC)	t consumption	0.6A					
External	Voltage	21.6 to 26.4VDC					
power supply	Current consumption	0.35A					
	Inrush current	2.4A					
Weight		0.5kg					

 $O: Compatible, \triangle: Partial \ change \ required, \ \times: Incompatible$

		artial orialigo roquilou,		
Q62DAN	Compatibility	Precautions for replacement		
Between the I/O terminal and programmable controller power supply:				
photocoupler isolation				
Between output channels: non-isolation	0			
Between external power supply and analog output: transformer isolation				
Between the I/O terminal and programmable controller power supply:	0			
500VAC, for 1 minute	0			
Between the I/O terminal and programmable controller power supply:	0			
500VDC, 20M Ω or more	0			
16 points		The number of occupied I/O points		
(I/O assignment: intelligent 16 points)	Δ	has changed to 16 points.		
18-point terminal block	×			
0.3 to 0.75mm ²	×	Wiring change is required.		
R1.25-3 (Sleeved solderless terminal cannot be used.)	×			
0.33A	0			
24VDC +20%, -15% Ripple, spike 500mV _{P-P} or less	0			
0.15A	0			
2.5A, 250µs or less	0			
0.19kg	0			

3.6.2 Functional comparison

O: Available, -: Not available

Item	Description	A62DA-S1	Q62DAN	Precautions for replacement
Analog output HOLD/CLEAR function	Retains an analog value before Output enable signal turns off when the Output enable signal is off.	O	O	1) Refer to ("Analog output status combination list" in the Digital-Analog Converter Module User's Manual to check the execution status of output. 2) For the Q62DAN, this function is set with the intelligent function module switch setting.
D/A conversion enable/disable function	Specifies whether to enable or disable the D/A conversion.	-	0	
D/A output enable/disable function	Specifies whether to output the D/A conversion value or the offset value.	0	0	The Q62DAN specifies whether to enable or disable output for each channel.
Synchronous output function	Obtains analog output synchronized with the programmable controller CPU.	-	0	
Analog output test while the programmable controller CPU is in the STOP status	Outputs the analog value converted from a digital value when CHD Output enable/ disable flag is forcibly turned on while the programmable controller CPU is in the STOP status.	-	0	
Resolution mode	Switches the resolution mode according to the application. The resolution can be selected from 1/4000, 1/12000, or 1/16000. The resolution mode is batch-set for all channels.	-	0	
Online module replacement	Replaces a module without stopping the system.	-	0	Replaceable modules during online are the Process CPU and the Redundant CPU.

3.6.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals and sequence program, refer to the Digital-Analog Converter Module User's Manual.

	A62D		Q62DAN				
Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	Device No.	Signal name
X0	Watchdog timer error	Y0		X0	Module READY	Y0	Not used
X1	D/A conversion READY	Y1		X1		Y1	CH1 Output enable/
	577 (3011 (310 (311 (312) 312)						disable flag
X2		Y2		X2		Y2	CH2 Output enable/
Va		V2		V2	Natural	Y3	disable flag
X3 X4		Y3 Y4		X3 X4	Not used	Y3 Y4	
X5		Y5		X5		Y5	
X6		Y6		X6		Y6	Not used
X7		Y7		X7		Y7	
					High resolution mode		
X8		Y8		X8	status flag	Y8	
X9		Y9		X9	Operating condition	Y9	Operating condition
79		19		79	setting completion flag	19	setting request
XA		YA		XA XB XC	Offset/gain setting mode	YA	User range write request
701		171			status flag	17.	Oder range write request
XB		YB			Channel change	YB	Channel change request
			Not used		completion flag		
XC		YC			Setting value change	YC	Setting value change
	-				completion flag Synchronous output		request Synchronous output
XD	Not used	YD			mode flag	YD	request
XE	1100 0000	YE		XE	Not used	YE	Not used
XF		YF		XF	Error flag	YF	Error clear request
X10		Y10					
X11		Y11					
X12		Y12					
X13		Y13					
X14		Y14					
X15		Y15					
X16		Y16					
X17 X18		Y17 Y18					
X10 X19		Y19					
X1A		Y19 Y1A					
X1B		Y1B	Output enable				
X1C	1	Y1C	p				
X1D	1	Y1D	Niet ad				
X1E	1	Y1E	Not used				
X1F		Y1F					

3.6.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs. For details of the buffer memories and sequence program, refer to the Digital-Analog Converter Module User's Manual.

	A62DA-S1					
Address	Name	Read/write	Address	Name	Read/write	
(decimal)	Name	Reau/write	(decimal)	Name	Read/write	
0	CH1 Digital value		0	D/A conversion enable/disable		
1	CH2 Digital value		1	CH1 Digital value	R/W	
2	CH1 Upper limit check code	R/W	2	CH2 Digital value		
3	CH1 Lower limit check code	17/77	3			
4	CH2 Upper limit check code		4			
5	CH2 Lower limit check code		5	System area (Not used)	-	
			to			
			10			
			11	CH1 Setting value check code	R	
			12	CH2 Setting value check code		
			13			
			to	System area (Not used)	-	
			18			
			19	Error code	R	
			20	Setting range (CH1 to CH2)		
			21	System area (Not used)	-	
			22	Offset/gain setting mode		
				Offset specification		
			23	Offset/gain setting mode	R/W	
				Gain specification		
			24	Offset/gain adjusted value specification		
			25			
			to	System area (Not used)	-	
			157			
			158	Mode switching setting	R/W	
			159	3 3		
			160			
			to	System area (Not used)	-	
			199		5.04	
			200	Pass data classification setting	R/W	
			201	System area (Not used)	-	
			202	CH1 Industrial shipment settings offset value		
	203 CH1 Industrial shipment settings gain val					
			204	CH2 Industrial shipment settings offset value		
	205 CH2 Industrial shipment settings gain value		R/W			
			206	CH1 User range settings offset value		
			207	CH1 User range settings gain value		
			208	CH2 User range settings offset value		
209 CH2 User range settings gain value						

3 ANALOG OUTPUT MODULE REPLACEMENT

3.7 A62DA-S1 (Replacement to the Q64DAN)

3.7.1 Performance comparison

lt	em		A62DA-S	51					
Digital input		0 to +4000							
Analog output		Current: +4 to +20mAD	Voltage: 0 to +10VDC (External load resistance value: 500Ω to $1M\Omega$) Current: +4 to +20mADC (External load resistance value: 0Ω to 600Ω) *Current output is usable by 0 to +20mA.						
I/O characteris	etics	Output range 0 to 10V 0 to 5V 0 to 20mA 1 to 5V 4 to 20mA	0 to 10V						
Maximum	Voltage	1 to 5V: 1mV (1/4000) 0 to 5V: 1.25mV (1/4000) 0 to 10V: 2.5mV (1/4000)							
resolution	Current	4 to 20mA: 4μA (1/4000) 0 to 20mA: 5μA (1/4000)							
Overall accura (accuracy at m output value)	ncy naximum analog	(Refer to *1.)							
Maximum conv	version speed	Within 15ms/2 channels (same time for one channel) Note) Time from when the digital input is written to when the specified analog voltage (current) is reached							
Absolute maxing	mum output	Voltage: 0 to +12V Current: 0 to +28mA Note) Max. output voltage and current restricted by output protection circuit							
Number of ana points	alog output		2 channels/m						
Number of writ	tes to E ² PROM		-						

Indicates accuracy at the maximum analog output value of the A62DA-S1.

Output range Temperature range	1 to 5V	0 to 5V	0 to 10V	4 to 20mA	0 to 20mA
25°C(within ±0.5%)	±25mV	±25mV	±50mV	±0.1mA	±0.1mA
0 to 55°C (within±1%)	±50mV	±50mV	±100mV	±0.2mA	±0.2mA

O: Compatible, \triangle : Partial change required, \times : Incompatible

					O: Compatible,	△ : Partial change required, ×: Incompatibl							
	Q64	4DAN			Compatibility	Precautions for replacement							
	16-bit sig												
	Normal resolution		0										
High reso	olution mode: -1228	38 to 12287											
Voltage: -10 to	10VDC (External	load resista	ance value: 1	kΩ to 1MΩ)									
	0mADC (External				0								
	`			,									
	Normal r	esolution	High res	solution									
Analanastas	mo	ode	mo										
Analog output	Digital input	Maximum	Digital input	Maximum									
	value	resolution	value	resolution									
0 to	o 5V 0 to	1.25mV	0 to	0.416mV									
1 to	o 5V 4000	1.0mV	12000	0.333mV									
Voltage -10 to	o 10V -4000 to	2.5mV	-16000 to 16000	0.625mV	0								
	range 4000 tings	0.75mV	-12000 to 12000	0.333mV									
0 to :	20mA 0 to	5 μ A	0 to	1.66 <i>µ</i> A									
Current 4 to 2	20mA 4000	4 / / A	12000	1.33 <i>µ</i> A									
	range -4000 to tings 4000	1.5 µA	-12000 to 12000	0.83 μ A									
Ar	mbient temperature	25+5°C: v	within +0.1%										
/"	(voltage: ±10m)												
Am	bient temperature	1.5	. ,		0								
	(voltage: ±30m\												
		channel	0										
	Voltage: ±12V			Voltage: ±12V			Voltage: ±12V					0	
	Currer	nt: 21mA											
	4 channe	els/module			0								
	Max. 100	0,000 times	3		0								
	Ava	ailable			0								

It	em	A62DA-S1	
Isolation metho	od	Between the output terminal and programmable controller power supply: photocoupler isolation (Between channels: non-isolation)	
Dielectric withs	stand voltage	-	
Insulation resis	stance	-	
Number of occ	upied I/O points	32 points (I/O assignment: special 32 points)	
Connected terr	minal	20-point terminal block	
Applicable wire	e size	0.75 to 2mm ² (Applicable tightening torque: 39 to 59N•cm)	
Applicable solo	derless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	
Internal current (5VDC)	t consumption	0.6A	
External	Voltage	21.6 to 26.4VDC	
power supply	Current consumption	0.35A	
	Inrush current	2.4A	
Weight		0.5kg	

O: Compatible, \triangle : Partial change required, \times : Incompatible

	O . Compatible	O. Compatible, A. Fartial change required, A. Incompatible			
Q64DAN	Compatibility	Precautions for replacement			
Between the I/O terminal and programmable controller power supply:					
photocoupler isolation					
Between output channels: non-isolation	0				
Between external power supply and analog output: transformer Isolation					
Between the I/O terminal and programmable controller power supply:	0				
500VAC, for 1 minute					
Between the I/O terminal and programmable controller power supply:	0				
500VDC, 20M Ω or more	0				
16 points	_	The number of occupied I/O points			
(I/O assignment: intelligent 16 points)	Δ	has changed to 16 points.			
18-point terminal block	×				
0.3 to 0.75mm ²	×	Wiring change is required.			
R1.25-3 (Sleeved solderless terminal cannot be used.)	×				
0.34A	0				
24VDC +20%, -15% Ripple, spike 500mV _{P-P} or less	0				
0.24A	0				
2.5A, 260µs or less	0				
0.20kg	0				

3.7.2 Functional comparison

O: Available, -: Not available

Item	Description	A62DA-S1	Q64DAN	Precautions for replacement
Analog output HOLD/CLEAR function	Retains an analog value before Output enable signal turns off when the Output enable signal is off.	0	0	1) Refer to ("Analog output status combination list" in the Digital-Analog Converter Module User's Manual to check the execution status of output. 2) For the Q64DAN, this function is set with the intelligent function module switch setting.
D/A conversion enable/disable function	Specifies whether to enable or disable the D/A conversion.	-	0	
D/A output enable/disable function	Specifies whether to output the D/A conversion value or the offset value.	0	0	The Q64DAN specifies whether to enable or disable output for each channel.
Synchronous output function	Obtains analog output synchronized with the programmable controller CPU.	-	0	
Analog output test while the programmable controller CPU is in the STOP status	Outputs the analog value converted from a digital value when CHD Output enable/ disable flag is forcibly turned on while the programmable controller CPU is in the STOP status.	-	0	
Resolution mode	Switches the resolution mode according to the application. The resolution can be selected from 1/4000, 1/12000, or 1/16000. The resolution mode is batch-set for all channels.	-	0	
Online module replacement	Replaces a module without stopping the system.	-	0	Replaceable modules during online are the Process CPU and the Redundant CPU.

3.7.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals and sequence program, refer to the Digital-Analog Converter Module User's Manual.

	A62D	A-S1			Q64DAN			
Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	
X0	Watchdog timer error	Y0		X0	Module READY	Y0	Not used	
X1	D/A conversion READY	Y1		X1		Y1	CH1 Output enable/	
							disable flag	
X2		Y2		X2		Y2	CH2 Output enable/ disable flag	
							CH3 Output enable/	
Х3		Y3		Х3	Not used	Y3	disable flag	
X4		Y4		X4		Y4	CH4 Output enable/	
							disable flag	
X5		Y5		X5		Y5		
X6		Y6		X6		Y6	Natural	
X7		Y7		X7	High resolution mode	Y7	Not used	
X8		Y8		X8	status flag	Y8		
X9		Y9		X9	Operating condition	Y9	Operating condition	
					setting completion flag Offset/gain setting mode		setting request	
XA		YA		XA	status flag	YA	User range write request	
XB		YB	Not used	XB	Channel change completion flag	YB	Channel change request	
VC.		YC		XC	Setting value change	YC	Setting value change	
XC		10		ΧC	completion flag	10	request	
XD	Not used	YD		XD	Synchronous output mode flag	YD	Synchronous output request	
XE		YE		XE	Not used	YE	Not used	
XF		YF		XF	Error flag	YF	Error clear request	
X10		Y10						
X11 X12		Y11 Y12						
X12 X13		Y13						
X14		Y14						
X15		Y15						
X16		Y16						
X17		Y17						
X18		Y18						
X19		Y19 Y1A						
X1A X1B		Y1A Y1B	Output enable					
X1C		Y1C	Output enable					
X1D		Y1D						
X1E		Y1E	Not used					
X1F		Y1F						

3.7.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs. For details of the buffer memories and sequence program, refer to the Digital-Analog Converter Module User's Manual.

	A62DA-S1			Q64DAN			
Address	Name	Read/write	Address	Name	Read/write		
(decimal)	CH1 Digital value		(decimal)	D/A conversion enable/disable			
1	CH2 Digital value		1	CH1 Digital value			
2	CH1 Voltage upper limit check code		2	CH2 Digital value	R/W		
3	CH2 Voltage lower limit check code	R/W	3	CH3 Digital value	17/77		
4	CH1 Current upper limit check code		4	CH4 Digital value			
5	CH2 Current lower limit check code	5		CH4 Digital Value			
			System area (Not used)	_			
			10	jerjotom area (Net assa)			
			11	CH1 Setting value check code			
			12	CH2 Setting value check code			
			13	CH3 Setting value check code	R		
			14	CH4 Setting value check code			
			15	January Value of Salar			
			to	System area (Not used)	_		
			18	, -, -, -, -, -, -, -, -, -, -, -, -, -,			
			19	Error code			
			20	Setting range (CH1 to CH4)	R		
			21	System area (Not used)	-		
				Offset/gain setting mode			
			22	Offset specification			
		Ot		Offset/gain setting mode	R/W		
			23	Gain specification			
			24	Offset/gain adjusted value specification			
		25					
			to	System area (Not used)	_		
			157				
			158		544		
			159	Mode switching setting	R/W		
			160				
			to	to System area (Not used)			
			199				
			200	Pass data classification setting	R/W		
			201	System area (Not used)	-		
			202	CH1 Industrial shipment settings offset value			
			203	CH1 Industrial shipment settings gain value			
			204	CH2 Industrial shipment settings offset value			
			205	CH2 Industrial shipment settings gain value			
			206	CH3 Industrial shipment settings offset value			
			207	CH3 Industrial shipment settings gain value			
			208	CH4 Industrial shipment settings offset value			
			209	CH4 Industrial shipment settings gain value	R/W		
			210	CH1 User range settings offset value	10,44		
			211	CH1 User range settings gain value			
			212	CH2 User range settings offset value			
			213	CH2 User range settings gain value			
			214	CH3 User range settings offset value			
			215	CH3 User range settings gain value			
			216	CH4 User range settings offset value			
			217	CH4 User range settings gain value			

3 ANALOG OUTPUT MODULE REPLACEMENT MELSEC

Memo		

3.8 A68DAI(-S1)

3.8.1 Performance comparison

It	tem				A68DA	AI (-S1)				
		(1)16-bit signed bir	nary								
		(2)Setting range:									
Digital input		Set resolution			Setting range						
Digital input			1/4000				0 to 400				
			1/8000				0 to 800	00			
			1/12000				0 to 120	00			
A 1					0 to 20	mADC	;				
Analog output				(External loa	nd resistan	ice val	ue: 0Ω to 600)Ω)			
				Dig	gital value re	esolutio	n	*Analog			
			•	1/4000	1/8000	0	1/12000	output value			
I/O characteris	I/O characteristics		Digital	4000	8000		12000	+20mA			
			input	2000	4000		6000	+12mA			
			value	0	0		0	+4mA]		
		*When offset value 4mA, gain value 20mA settings									
Maximum	1/4000		5.0μΑ								
resolution of	1/8000	2.5μΑ									
analog value	1/12000	1.6µA									
Overall accura (accuracy at m output value)		±1.0% (±200μA)									
Conversion sp	eed	Within 40ms/8 channels (same time for one channel)									
00114013101131		Note) Time	from when	the digital inpu			nen the specif	fied analog valu	ie is reached		
Absolute maxi	mum output				0 to +						
			Note) N	/lax. output cur	rrent restri	cted b	y output prote	ection circuit		\perp	
Number of ana points	alog output				8 channe	ls/mod	lule				

O: Compatible, △: Partial change required, ×: Incompatible

							O: Compatible, △: Partial change required, ×: Incompatible Compatibility Precautions for replacement			
Q68DAIN (Precautions for replacement		
16-bit signed binary (Normal resolution mode: -4096 to 4095, High resolution mode: -12288 to 12287)						0				
0 to 20mADC (External load resistance value: 0Ω to 600Ω)										
Analog output range Digital Maximum polytical input value resolution value resolution Current O to 20mA O to 4000 4µA O to 12000 1.33µA User range -4000 to settings 4000 1.5µA 1.2000 0.83µA							0			
Ambient temperature 25±5°C: within ±0.1% (±20μA) Ambient temperature 0 to 55°C: within ±0.3% (±60μA)						0				
80μs/channel						0				
		21m	ıΑ				0			
		8 channels	s/module				0			

It	em	A68DAI (-S1)					
Number of writ	tes to E ² PROM	-					
Output short p	rotection	-					
Isolation method		Between the output terminal and programmable controller power supply: photocoupler isolation (Between channels: non-isolation)					
Dielectric withs	stand voltage	-					
Insulation resis	stance	-					
Number of occupied I/O points		32 points (I/O assignment: special 32 points)					
Connected terr	minal	38-point terminal block					
Applicable wire	e size	0.75 to 2mm ² (Applicable tightening torque: 39 to 59N•cm)					
Applicable solo	derless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A					
Internal curren (5VDC)	t consumption	0.15A					
Futomal	Voltage	21.6 to 26.4VDC					
External power supply	Current consumption	0.4A					
	Inrush current	-					
Weight		0.65kg					

O: Compatible, \triangle : Partial change required, \times : Incompatible

Q68DAIN	Compatibility	Precautions for replacement
Max. 100,000 times	0	
Available	0	
Between the I/O terminal and programmable controller power supply:		
photocoupler isolation		
Between output channels: non-isolation	0	
Between external power supply and analog output: transformer isolation		
Between the I/O terminal and programmable controller power supply:	0	
500VAC, for 1 minute	0	
Between the I/O terminal and programmable controller power supply:	0	
500VDC, 20M Ω or more	O	
16 points	Δ	The number of occupied I/O points
(I/O assignment: intelligent 16 points)		has changed to 16 points.
18-point terminal block	×	
0.3 to 0.75mm ²	×	
FG terminal: R1.25-3, 1.25-YS3, RAV1.25-3, V1.25-YS3A		Wiring change is required.
Terminals other than FG: R1.25-3	×	
(Sleeved solderless terminal cannot be used.)		
0.38A		The recalculation of internal current
0.30A	Δ	consumption (5VDC) is required.
24VDC +20%, -15%		
Ripple, spike 500mVp-p or less		
 0.27A		
2.5A, 230µs or less	-	
0.20kg	0	

3.8.2 Functional comparison

O: Available, -: Not available

		A COD AL	060	O : Available, - : Not available	
Item	Description	A68DAI (-S1)	Q68 DAIN	Precautions for replacement	
D/A conversion enable/ disable function	Specifies whether to enable or disable the D/A conversion for each channel.	0	0	On Q68DAIN, by disabling the D/A conversion for the channels that are not used, the conversion speed can be shortened.	
D/A output enable/disable function	Specifies whether to output the D/A conversion value or the offset value for each channel. The conversion speed stays constant regardless of whether D/A output is enabled or disabled.	0	0	On Q68DAIN, the output enable/ disable is set with Y signal (CH□ Output enable/disable flag).	
Synchronous output function	Obtains analog output synchronized with the programmable controller CPU. The analog output will be updated after Synchronous output request (YD) is set to ON and the time specified as "programmable controller CPU processing time + 120µs" has elapsed. However, the analog output will be fixed to CH1, and other channels (CH2 to CH8) cannot be used. When the module is mounted on a remote I/O station, the analog output will not be synchronized because of a link scan delay if the synchronous output function is specified.	-	0		
Analog output HOLD/ CLEAR function	Retains an analog value that was output when the programmable controller CPU is in the STOP status or an error occurs.	0	0	1) On Q68DAIN, the setting of HOLD/CLEAR is carried out for each channel. 2) For the Q68DAIN, this function is set with the intelligent function module switch setting. 3) Refer to ("Analog output status combination list" in the Digital-Analog Converter Module User's Manual to check the execution status of output.	
Analog output test while the programmable controller CPU is in the STOP status	Outputs the analog value converted from a digital value when CH□ Output enable/disable flag is forcibly turned on while the programmable controller CPU is in the STOP status. D/A conversion	-	0		
Resolution mode	Switches the resolution mode according to the application. The resolution can be selected from 1/4000 or 1/12000. The resolution mode is batch-set for all channels.	0	0		
Online module replacement	Replaces a module without stopping the system.	-	0	Replaceable modules during online are the Process CPU and the Redundant CPU.	

3.8.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals and sequence program, refer to the Digital-Analog Converter Module User's Manual.

	A68DAI (-S1)				Q68DAIN				
Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	Device No.	Signal name		
X0	Watchdog timer error flag	Y0		X0	Module READY	Y0	Not used		
X1	D/A conversion READY	Y1		X1		Y1	CH1 Output enable/		
——————————————————————————————————————	flag	• •		Λ1		• •	disable flag		
X2	Error flag	Y2		X2		Y2	CH2 Output enable/		
	ay	. –					disable flag		
Х3		Y3		Х3		Y3	CH3 Output enable/ disable flag		
X4		Y4		X4	Not used	Y4	CH4 Output enable/ disable flag		
X5		Y5		X5		Y5	CH5 Output enable/ disable flag		
X6		Y6	Not used	X6		Y6	CH6 Output enable/ disable flag		
X7		Y7		X7		Y7	CH7 Output enable/ disable flag		
X8		Y8		X8	High resolution mode status flag	Y8	CH8 Output enable/ disable flag		
					Operating condition		Operating condition		
X9		Y9		X9	setting completion flag	Y9	setting request		
XA		YA		XA	Offset/gain setting mode status flag	YA	User range write request		
ХВ		YB		XB	Channel change completion flag	YB	Channel change request		
XC	Not used	YC		XC	Setting value change completion flag	YC	Setting value change request		
XD		YD	Interlock signal for the RFRP and RTOP	XD	Synchronous output mode flag	YD	Synchronous output request		
XE		YE	instructions when the	XE	Not used	YE	Not used		
XF		YF	A68DAI(-S1) is used in remote I/O station	XF	Error flag	YF	Error clear request		
X10		Y10							
X11		Y11							
X12		Y12							
X13		Y13	D/A conversion output						
X14		Y14	enable flag						
X15		Y15							
X16		Y16							
X17		Y17							
X18		Y18	Error reset flag						
X19		Y19							
X1A		Y1A V1D							
X1B X1C		Y1B Y1C							
X1C X1D	Interlock signal for the	Y1C Y1D	Not used						
X1E	RFRP and RTOP	Y1E	INOL USEU						
A I L	instructions when the	IIL							
X1F	A68DAI(-S1) is used in	Y1F							
7311	remote I/O station								
	. S October 5 Citation								

3.8.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs. For details of the buffer memories and sequence program, refer to the Digital-Analog Converter Module User's Manual.

	A68DAI(-S1)			Q68DAIN	
Address		Donald with	Address		Dec discussion
(decimal)	Name	Read/write	(decimal)	Name	Read/write
0	D/A conversion enable/disable channel		0	D/A conversion enable/disable	
1	CH1 Digital value		1	CH1 Digital value	
2	CH2 Digital value		2	CH2 Digital value	
3	CH3 Digital value		3	CH3 Digital value	
4	CH4 Digital value	R/W	4	CH4 Digital value	R/W
5	CH5 Digital value	TC/VV	5	CH5 Digital value]
6	CH6 Digital value		6	CH6 Digital value]
7	CH7 Digital value		7	CH7 Digital value	
8	CH8 Digital value		8	CH8 Digital value	
9	Resolution of digital value		9	System area (Not used)	
10	CH1 Setting value check code		10	System area (Not used)	-
11	CH2 Setting value check code		11	CH1 Setting value check code	
12	CH3 Setting value check code		12	CH2 Setting value check code]
13	CH4 Setting value check code	R	13	CH3 Setting value check code]
14	CH5 Setting value check code	K	14	CH4 Setting value check code]
15	CH6 Setting value check code		15	CH5 Setting value check code	
16	CH7 Setting value check code		16	CH6 Setting value check code	R
17	CH8 Setting value check code		17	CH7 Setting value check code	
			18	CH8 Setting value check code	
			19	Error code	
			20	Setting range (CH1 to CH4)	
			21	Setting range (CH5 to CH8)	
			22	Offset/gain setting mode	
			22	Offset specification	
			23	Offset/gain setting mode	R/W
			23	Gain specification	
			24	Offset/gain adjusted value specification	
			25		
			to	System area (Not used)	-
			157		
			158	Mode switching setting	R/W
			159	wode switching setting	IN/VV
			160		
			to	System area (Not used)	-
			201		
			202	CH1 Industrial shipment settings offset value	
			203	CH1 Industrial shipment settings gain value	
			204	CH2 Industrial shipment settings offset value	
			205	CH2 Industrial shipment settings gain value	R/W
			206	CH3 Industrial shipment settings offset value	
			207	CH3 Industrial shipment settings gain value	
			208	CH4 Industrial shipment settings offset value	

	Q68DAIN	
Address	Name	Read/write
(decimal)	Name	iteau/wille
209	CH4 Industrial shipment settings gain value	
210	CH5 Industrial shipment settings offset value	
211	CH5 Industrial shipment settings gain value	
212	CH6 Industrial shipment settings offset value	
213	CH6 Industrial shipment settings gain value	
214	CH7 Industrial shipment settings offset value	
215	CH7 Industrial shipment settings gain value	
216	CH8 Industrial shipment settings offset value	
217	CH8 Industrial shipment settings gain value	
218	CH1 User range settings offset value	
219	CH1 User range settings gain value	
220	CH2 User range settings offset value	
221	CH2 User range settings gain value	R/W
222	CH3 User range settings offset value	
223	CH3 User range settings gain value	
224	CH4 User range settings offset value	
225	CH4 User range settings gain value	
226	CH5 User range settings offset value	
227	CH5 User range settings gain value	
228	CH6 User range settings offset value	
229	CH6 User range settings gain value	
230	CH7 User range settings offset value	
231	CH7 User range settings gain value	
232	CH8 User range settings offset value	
233	CH8 User range settings gain value	

3.9 A68DAV

3.9.1 Performance comparison

It	em				A68DAV				
		(1)16-bit signed bit	nary						
		(2)Setting range:	•						
		() = = = 3 = 3 =							
Digital input			Setting resolution			Setting ra	nge		
				1/4000		-4000 to 4	1000		
				1/8000		-8000 to 8	3000		
				1/12000		-12000 to 1	2000		
					-10 to 0 to 10V	DC			
Analog output				(External load	d resistance val	ue: 2kΩ to 1M	ΙΩ)		
				Dig	gital value resoluti	on	*Analog	1	
				1/4000	1/8000	1/12000	output value		
				4000	8000	12000	+10V	1	
I/O characteris	tics		Digital	2000	4000	6000	+5V		
		I	input	0	0	0	0V]	
		I	value	-2000	-4000	-6000	-5V	1	
				-4000	-8000	-12000	-10V]	
				*When offset	value 0V, gain v	alue 10V sett	ings		
Maximum	1/4000				2.5mV				
resolution of	1/8000				1.25mV				
analog value	1/12000				0.83mV				
Overall accura	-								
	aximum analog				±1.0% (±100m	ıV)			
output value)									
Conversion sp	eed				nannels (same t				
		Note) Time	from when	the digital inpu	it is written to w		fied analog valu	ue is reached	
Absolute maxii	mum output				-12 to +12V				
			Note) N	lax. output voli	tage restricted b	by output prote	ection circuit		
Number of ana	alog output				8 channels/mod	dule			
points	-2								
	tes to E ² PROM				-				
Output short p	rotection				-				
Isolation metho	od	Between the	e output tern	ninal and prog	rammable conti	oller power su	ıpply: photocou	pler isolation	
isolation metho	Ju	(Between channels: non-isolation)							
Dielectric withs	stand voltage								
Insulation resis	stance		_		-				
Numberet	unied I/O mainte				32 points				
	cupied I/O points				ignment: specia				
Connected terr	minal			38	3-point terminal				
Applicable wire	e size				0.75 to 2mm	2			
Applicable Wile	J 0120			(Applicable t	ightening torque	e: 39 to 59N•c	m)		
Appliachla	dorlogo torminal			V4 0E 0 V	/1 05 VC2A V	62 V0 V00A			
Applicable solo	derless terminal			V 1.25-3, V	/1.25-YS3A, V2	-33, VZ-YS3A			
Internal curren	t consumption				0.15A				
(5VDC)									1

O : Compatible, \triangle : Partial change required, \times : Incompatible

						O: Compatible, △: Partial change required, ×: Incompatible			
		Q6	8DAVN			Compatibility	Precautions for replacement		
		16-bit s ormal resolutior tion mode: -12	0						
	-10 to 10VD	C (External loa	d resistance v	/alue: 1kΩ to 1MΩ	2)	0			
Volta	Analog output range 0 to 5V 1 to 5V -10 to 10V User range settings	Normal reso Digital input value 0 to 4000 -4000 to 4000	lution mode Maximum resolution 1.25mV 1.0mV 2.5mV 0.75mV	High resolut Digital input value 0 to 12000 -16000 to 16000 -12000 to 12000	ion mode Maximum resolution 0.416mV 0.333mV 0.625mV 0.333mV	0			
		•		±0.1% (±10mV) ±0.3% (±30mV)		0			
		80μ։	s/channel			0			
		:	±12V			0			
		8 chan	nels/module			0			
		Max. 10	00,000 times			0			
		A۱	/ailable			0			
	Between the I/O t Between external p	photocou tween output o	upler isolation hannels: non	-isolation		0			
	Between the I/O t		ogrammable , for 1 minute		supply:	0			
	Between the I/O	terminal and pr		controller power	supply:	0			
	16 points (I/O assignment: intelligent 16 points)						The number of occupied I/O points has changed to 16 points.		
	18-point terminal block						-		
	0.3 to 0.75mm ²						Wiring change is required.		
		l: R1.25-3, 1.25 Terminals othe ved solderless	er than FG: R		A	×			
		(D.38A			Δ	The recalculation of internal current consumption (5VDC) is required.		

Item		A68DAV	
Futomol	Voltage	21.6 to 26.4VDC	
External power supply	Current consumption	0.2A	
	Inrush current	-	
Weight		0.6kg	

 $O: Compatible, \triangle: Partial \ change \ required, \ \times: Incompatible$

Q68DAVN	Compatibility	Precautions for replacement
24VDC +20%, -15%		
Ripple, spike 500mVp-p or less		
0.20A	0	
2.5A, 230µs or less		
0.20kg	0	

3.9.2 Functional comparison

					O : Available, - : Not available
Item	Description		A68DAV	Q68DAVN	Precautions for replacement
D/A conversion enable/ disable function	Specifies whether to enable or disal conversion for each channel.	ble the D/A	0	0	On Q68DAVN, by disabling the D/A conversion for the channels that are not used, the conversion speed can be shortened.
D/A output enable/ disable function	Specifies whether to output the D/A the offset value for each channel. The conversion speed stays consta whether D/A output is enabled or di	nt regardless of sabled.	0	0	On Q68DAVN, the output enable/ disable is set with Y signal (CH□ Output enable/disable flag).
Synchronous output function	Obtains analog output synchronized programmable controller CPU. The analog output will be updated a output request (YD) is set to ON an as "programmable controller CPU p 120µs" has elapsed. However, the analog output will be other channels (CH2 to CH8) cannow When the module is mounted on a sufficient to the analog output will not be synchronized in the synchronous of specified.	after Synchronous d the time specified processing time + fixed to CH1, and to be used. remote I/O station, onized because of a	-	0	
Analog output HOLD/ CLEAR function	Retains an analog value that was of programmable controller CPU is in an error occurs.	•	0	0	On Q68DAVN, the setting of HOLD/CLEAR is carried out for each channel. For the Q68DAVN, this function is set with the intelligent function module switch setting. Refer to ("Analog output status combination list" in the Digital-Analog Converter Module User's Manual to check the execution status of output.
Analog output test while the programmable controller CPU is in the STOP status	when CH□ Output enable/disable flon while the programmable controlled STOP status. D/A conversion	etting enable/disable Enable Disable ombi ation CH□ Output enable/disable Enable Disable flag Not		0	
Resolution mode	Switches the resolution mode accor application. The resolution can be selected from 1/16000. The resolution mode is batch-set fo	1/4000, 1/12000, or	0	0	
Online module replacement	Replaces a module without stopping	g the system.	-	0	Replaceable modules during online are the Process CPU and the Redundant CPU.

3.9.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals and sequence program, refer to the Digital-Analog Converter Module User's Manual.

	A68DAV				Q68DAVN				
Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	Device No.	Signal name		
X0	Watchdog timer error flag	Y0		X0	Module READY	Y0	Not used		
X1	D/A conversion READY	Y1		X1		Y1	CH1 Output enable/		
, , ,	flag						disable flag		
X2	Error flag	Y2		X2		Y2	CH2 Output enable/		
							disable flag		
Х3		Y3		Х3		Y3	CH3 Output enable/ disable flag		
X4		Y4		X4	Not used	Y4	CH4 Output enable/ disable flag		
X5		Y5		X5		Y5	CH5 Output enable/ disable flag		
X6		Y6	Not used	X6		Y6	CH6 Output enable/ disable flag		
X7		Y7	Not dood	X7		Y7	CH7 Output enable/ disable flag		
X8		Y8		X8	High resolution mode	Y8	CH8 Output enable/		
					status flag Operating condition		disable flag		
X9		Y9		X9	setting completion flag	Y9	Operating condition setting request		
XA		YA		XA	Offset/gain setting mode status flag	YA	User range write request		
ХВ		YB		XB	Channel change completion flag	YB	Channel change request		
хс	Not used	YC		XC	Setting value change completion flag	YC	Setting value change request		
XD		YD	Interlock signal for the RFRP and RTOP	XD	Setting value change completion flag	YD	Synchronous output request		
XE		YE	instructions when the	XE	Not used	YE	Not used		
XF		YF	A68DAV is used in remote I/O station	XF	Error flag	YF	Error clear request		
X10		Y10							
X11		Y11							
X12		Y12							
X13		Y13	D/A conversion output						
X14		Y14	enable flag						
X15		Y15							
X16		Y16							
X17		Y17	From road floor						
X18 X19		Y18 Y19	Error reset flag						
X19 X1A		Y1A							
X1B		Y1B							
X1C		Y1C							
X1D	Interlock signal for the	Y1D	Not used						
X1E	RFRP and RTOP	Y1E							
	instructions when the								
X1F	A68DAV is used in	Y1F							
	remote I/O station								

3.9.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs. For details of the buffer memories and sequence program, refer to the Digital-Analog Converter Module User's Manual.

A68DAV				Q68DAVN		
Address			Address	Address		
(decimal)	Name	Read/write	(decimal)	Name	Read/write	
0	D/A conversion enable/disable channel		0	D/A conversion enable/disable		
1	CH1 Digital value		1	CH1 Digital value		
2	CH2 Digital value CH3 Digital value CH4 Digital value		2	CH2 Digital value		
3			3	CH3 Digital value		
4			4	CH4 Digital value		
5	CH5 Digital value	R/W	5	CH5 Digital value	R/W	
6	CH6 Digital value		6	CH6 Digital value		
7	CH7 Digital value		7	CH7 Digital value		
8	CH8 Digital value		8	CH8 Digital value		
9	Resolution of digital value		9	Cyctom area (Net yeard)]	
10	CH1 Setting value check code		10	System area (Not used)		
11	CH2 Setting value check code		11	CH1 Setting value check code		
12	CH3 Setting value check code		12	CH2 Setting value check code		
13	CH4 Setting value check code	R	13	CH3 Setting value check code	R	
14	CH5 Setting value check code	K	14	CH4 Setting value check code		
15	CH6 Setting value check code		15	CH5 Setting value check code		
16	CH7 Setting value check code		16	CH6 Setting value check code		
17	CH8 Setting value check code		17	CH7 Setting value check code		
			18	CH8 Setting value check code		
				Error code		
				Setting range (CH1 to CH4)		
			21	Setting range (CH5 to CH8)		
			22	Offset/gain setting mode		
			22	Offset specification		
			23	Offset/gain setting mode	R/W	
				Gain specification		
			24	Offset/gain adjusted value specification		
			25			
				System area (Not used)	-	
			158	Mode switching setting	R/W	
		159 Mode switching setting			1000	
			160	System area (Not used)		
					-	
			201			
			202	CH1 Industrial shipment settings offset value		
			203	CH1 Industrial shipment settings gain value		
				CH2 Industrial shipment settings offset value	R/W	
				CH2 Industrial shipment settings gain value		
				CH3 Industrial shipment settings offset value		
			207	CH3 Industrial shipment settings gain value		
			208	CH4 Industrial shipment settings offset value		

	Q68DAVN						
Address	Name	Decelhorite					
(decimal)	Name	Read/write					
209	CH4 Industrial shipment settings gain value						
210	CH5 Industrial shipment settings offset value						
211	CH5 Industrial shipment settings gain value						
212	CH6 Industrial shipment settings offset value						
213	CH6 Industrial shipment settings gain value						
214	CH7 Industrial shipment settings offset value						
215	CH7 Industrial shipment settings gain value						
216	CH8 Industrial shipment settings offset value						
217	CH8 Industrial shipment settings gain value						
218	CH1 User range settings offset value						
219	CH1 User range settings gain value						
220	CH2 User range settings offset value						
221	CH2 User range settings gain value	R/W					
222	CH3 User range settings offset value						
223	CH3 User range settings gain value						
224	CH4 User range settings offset value						
225	CH4 User range settings gain value						
226	CH5 User range settings offset value						
227	CH5 User range settings gain value						
228	CH6 User range settings offset value						
229	CH6 User range settings gain value						
230	CH7 User range settings offset value						
231	CH7 User range settings gain value						
232	CH8 User range settings offset value						
233	CH8 User range settings gain value						

4

TEMPERATURE INPUT MODULE REPLACEMENT

4.1 List of Temperature Input Module Alternative Models for Replacement

Production discontinuation			Transition to Q series				
Product	Model	Model	Remarks (Restrictions)				
	A616TD* ¹ A60MXT(N)	Q64TD	External wiring : Cable size is changed. Changed (4 modules are required when one A616TD and one A60MXT(N) are used.) The number of occupied I/O points, I/O signals, and buffer memory addresses are changed. Performance specifications change: 4CH/module Functional specifications: Not changed				
		Q68TD-G-H02 Q68TD-G-H01	External wiring : Connector wiring and cable size are changed. Changed (2 modules are required when one A616TD and one A60MXT(N) are used.)				
	A68RD3N	Q64RD	External wiring : Cable size is changed. Number of slots: : Changed (2 modules are required.) The number of occupied I/O points, I/O signals, and buffer memory addresses are changed. Performance specifications change: 4CH/module Functional specifications: Not changed				
Temperature input module		Q64RD-G	1) External wiring : Cable size is changed. 2) Number of slots : Changed (2 modules are required.) 3) Program : The number of occupied I/O points, I/O signals, and buffer memory addresses are changed. 4) Performance specifications change: 4CH/module 5) Functional specifications: RTD Ni100-compliant and transformer isolation is provided between channels.				
		Q68RD3-G	Connector wiring and cable size are changed. Number of slots: Number of slots: Not changed: The number of occupied I/O points, I/O signals, and buffer memory addresses are changed. Performance specifications change: Resolution and conversion speed Functional specifications: 32-bit output is not available. RTD Ni100-compliant and transformer isolation is provided between channels.				
	A68RD4N	Q64RD	External wiring: Cable size is changed. Changed (2 modules are required.) The number of occupied I/O points, I/O signals, and buffer memory addresses are changed. Performance specifications change: 4CH/module Functional specifications: Not changed				
		Q64RD-G	External wiring : Cable size is changed. Number of slots : Changed (2 modules are required.) The number of occupied I/O points, I/O signals, and buffer memory addresses are changed. Performance specifications change: 4CH/module Functional specifications: RTD Ni100-compliant and transformer isolation is provided between channels.				

*1 Depending on the connected sensor and the analog input range, use each module in combination (A616TD, A60MX, A60MXR, A60MXRN, A60MXTN) as shown below.

The description in this chapter is based on the condition with "Thermocouple" connected, which is a general use.

Module combination	Thermocouple	Sensor other than thermocouple			
Module Combination	Thermocoupie	0 to 10V	-10 to 10V, -20 to 20mA		
A616TD + A60MXT(N)	0	0	-		
A616TD + A60MXT(N) + A60MX(R/RN)	0	0	0		
A616TD + A60MX(R/RN)	-	0	0		
A616TD	-	0	-		

4.2 A616TD (Replacement to the Q64TD)

4.2.1 Performance comparison

(1) Performance comparison list

Item	1	A616TD (When using the A60MXT and A60MXTN together)					
Temperature sens	sor input	-200 to 1800°C					
D	igital output	16-bit signed binary					
va	alue	(0 to 4000) (Data part: 12 bits)					
•	etected	16-bit signed binary					
	emperature	(-2000 to 18000: value up to the first decimal place × 10)					
Applicable thermocouple		Refer to Section 4.2.1 (2).					
Measured temper accuracy	rature range	Refer to Section 4.2.1 (2).					
Overall accuracy		Refer to the table in Section 4.2.1 (2).	_				
Overall accuracy		Measured temperature range accuracy ±0.5°C					
Maximum convers	sion speed	50ms/channel					
Isolation method		Between the input terminal and programmable controller power supply: photocoupler isolation Between channels: non-isolation (1M Ω resistor isolation)					
Number of temper input points	rature sensor	15 points/module (A60MXT, A60MXTN) (The A60MXT and A60MXTN can be mounted up to seven in total to one A616TD.)					
Number of occupi	ied I/O points	32 points (I/O assignment: special 32 points)					
External connection system		38-point terminal block					
Applicable wire size	ze	0.75 to 2mm ² (Applicable tightening torque: 39 to 59N•cm)					
Applicable solderl	less terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A					
Internal current consumption (5VDC)		1.0A					
Weight		0.85kg					

^{*1} Calculate the accuracy in the following method.

(Accuracy) = (Conversion accuracy) + (Temperature characteristics) × (Operating ambient temperature variation)

^{+ (}Cold junction compensation accuracy)

An operating ambient temperature variation indicates a deviation of the operating ambient temperature from the $25\pm5^{\circ}$ C range.

O : Compatible, \triangle : Partial change required, \star : Incompatible

	_	CATD		· ·	Dressutions for replacement
	Q	64TD		Compatibility	Precautions for replacement
	-270 t	o 1820°C		0	
16-bit	signed bii	0			
(-2700 to 18200:		gned binary to the first decima	place × 10)	0	
R	efer to Se	Δ	As the applicable thermocouples and thermocouple compliance standards differ, refer to Section 4.2.1 (2) to check the specifications, and use the thermocouple that can be used with the Q64TD.		
R	efer to Se	Δ	As they depend on the applicable thermocouple and measured		
		*1		0	temperature range, refer to Section 4.2.1 (2) to check the specifications.
	40ms	s/channel		0	
Between thermocouple input and earth Between thermocouple input channels Between cold junction compensation input (Pt100)	solation method ansformer isolation ansformer solation	Dielectric withstand voltage 1780VrmsAC/3 cycles (altitude 2000m)	Insulation resistance $500 \text{VDC } 100 \text{M}\Omega$ or more $500 \text{VDC } 10 \text{M}\Omega$ or more $-$	0	
and ground	4 chanr	nels/module		×	Consider replacement with multiple Q64TD.
(I/O ass	16 signment:	Δ	The number of occupied I/O points has changed to 16 points.		
	18-point t	×			
	0.3 to	×	Wiring change is required.		
(Sleeved so	1.25-3 olderless t	×			
	().50A		0	
	0	.25kg		0	

(2) Applicable thermocouple and measured temperature range accuracy

A616TD								
				Measurement range	1	2	3	4
JIS	ANSI	DIN	BS	number	· ·		J	_
313	ANOI	DIN		Allowable input voltage range [mV]	-12.5 to 12.5	0 to 25	0 to 50	0 to 100
В	В		PtRh30-	Measured temperature range [°C]	100 to 1500	100 to 1800	100 to 1800	100 to 1800
Б	В	-	PtRh6	Accuracy at 25°C [%]		±0.5		
				Temperature drift [%/°C]] -	±0.013	-	-
ם	В		D4Db42 D4	Measured temperature range [°C]	0 to 1000	0 to 1700	0 to 1700	0 to 1700
R	R	-	PtRh13-Pt	Accuracy at 25°C [%]		±0.4		
				Temperature drift [%/°C]] -	±0.011	-	-
S	S	PtRh-Pt	PtRh10-Pt	Measured temperature range [°C]	0 to 1200	0 to 1700	0 to 1700	0 to 1700
3	3	i dxii-i t	T tixiiio-i t	Accuracy at 25°C [%]	_	±0.4	_	_
				Temperature drift [%/°C]	_	±0.011	_	
I Z	V	K NiCr-Ni	NiCr-NiAl	Measured temperature range [°C]	-200 to 250	0 to 500	0 to 1000	0 to 1300
K	,			Accuracy at 25°C [%]	±0.4	±0.3	±0.3	±0.5
				Temperature drift [%/°C]	±0.011	±0.01	±0.01	±0.013
٦	E		AUG G AU	Measured temperature range [°C]	-200 to 150	0 to 300	0 to 600	0 to 1000
E	E	-	NiCr-CuNi	Accuracy at 25°C [%]	±0.4	±0.3	±0.3	±0.4
				Temperature drift [%/°C]	±0.011	±0.01	±0.01	±0.011
J	J		Fe-CuNi	Measured temperature range [°C]	-200 to 200	0 to 400	0 to 800	0 to 1200
J	3	-		Accuracy at 25°C [%]	±0.4	±0.3	±0.3	±0.4
				Temperature drift [%/°C]	±0.011	±0.01	±0.01	±0.011
Т	Т		Cu-CuNi	Measured temperature range [°C]	-200 to 200	0 to 400	0 to 400	0 to 400
'	'	_	Gu-Guivi	Accuracy at 25°C [%]	±0.5	±0.3	_	_
				Temperature drift [%/°C]	±0.013	±0.01	_	
		Eo CuNi		Measured temperature range [°C]	-100 to 200	0 to 400	0 to 800	0 to 900
-	-	Fe-CuNi	-	Accuracy at 25°C [%]		±0.3	±0.3	±0.5
				Temperature drift [%/°C]	_	±0.01	±0.01	±0.013
		Cu-CuNi		Measured temperature range [°C]	-100 to 200	0 to 400	0 to 600	0 to 600
-	-	Cu-Cuivi	-	Accuracy at 25°C [%]	_	±0.3	±0.4	_
				Temperature drift [%/°C]	_	±0.01	±0.011	_

_		

			Q64TD			
JIS			Specifications			
	Measured temperature range [°C]	0 to 600	600 to 800	800 to 1700	1700 to 1820	
В	Conversion accuracy at 25±0.5°C [°C]		±3.0	±2.5		
	Temperature characteristics [°C]	-	±0.4	±0.4	-	
	Measured temperature range [°C]	-50 to 0	0 to 300	300 to 1600	1600 to 1760	
R	Conversion accuracy at 25±0.5°C [°C]	_	±2.5	±2.0	_	
	Temperature characteristics [°C]		±0.4	±0.3		
	Measured temperature range [°C]	-50 to 0	0 to 300	300 to 1600	1600 to 1760	
S	Conversion accuracy at 25±0.5°C [°C]	-	±2.5	±2.0	-	
	Temperature characteristics [°C]		±0.4	±0.3		
	Measured temperature range [°C]	-270 to -200	-200 to 0	0 to 1200	1200 to 1370	
К	Conversion accuracy at 25±0.5°C [°C]	-	Larger value of ±0.5°C, or ±0.5% of measured temperature	Larger value of ±0.5°C, or ±0.25% of measured temperature	re _	
	Temperature characteristics [°C]		Larger value of ±0.06°C, or ±0.2% of measured temperature	Larger value of ±0.06°C, or ±0.02% of measured temperature		
	Measured temperature range [°C]	-270 to -200	-200 to 0	0 to 900	900 to 1000	
E	Conversion accuracy at 25±0.5°C [°C]		Larger value of ±0.5°C, or ±0.5% of measured temperature	Larger value of ±0.5°C, or ±0.25% of measured temperature		
	Temperature characteristics [°C]	-	Larger value of ±0.06°C, or ±0.15% of measured temperature	Larger value of ±0.06°C, or ±0.02% of measured temperature	-	
	Measured temperature range [°C]	-210 to -40	-40 to 750	750 to 1200	-	
J	Conversion accuracy at 25±0.5°C [°C]	-	Larger value of ±0.5°C, or ±0.25% of measured temperature	-	-	
	Temperature characteristics [°C]	-	Larger value of ±0.06°C, or ±0.02% of measured temperature	-	-	
	Measured temperature range [°C]	-270 to -200	-200 to 0	0 to 350	350 to 400	
Т	Conversion accuracy at 25±0.5°C [°C]	-	Larger value of ±0.5°C, or ±0.5% of measured temperature	Larger value of ±0.5°C, or ±0.25% of measured temperature	-	
	Temperature characteristics [°C]	-	Larger value of ±0.06°C, or ±0.1% of measured temperature	Larger value of ±0.06°C, or ±0.02% of measured temperature	-	
	Measured temperature range [°C]	-270 to -200	-200 to 0	0 to 1250	1250 to 1300	
N	Conversion accuracy at 25±0.5°C [°C]	-	Larger value of ±0.5°C, or ±0.5% of measured temperature	Larger value of ±0.5°C, or ±0.25% of measured temperature	-	
	Temperature characteristics [°C]	-	Larger value of ±0.06°C, or ±0.2% of measured temperature	Larger value of ±0.06°C, or ±0.02% of measured temperature	-	

4.2.2 Functional comparison

O: Available, -: Not available

Item	Description	A616TD	Q64TD	Precautions for replacement
Temperature conversion function	Imports temperature data.	0	0	
Conversion enable/disable	Sets whether to enable/disable a	_	_	
function	conversion per channel.	0	0	
Disconnection detection function	Detects a disconnection of the connected thermocouple of each channel.	0	0	On Q64TD, the channel set conversion enable automatically performs the disconnection detection.
Temperature conversion value storage	Stores imported temperature data in the buffer memory.	0	0	
Input type selection function	Sets an input type for each channel.	0	0	For the Q64TD, this function is set with the intelligent function module switch setting.
Warning output function	Outputs a warning when the temperature exceeds the set temperature range.	-	0	
Temperature conversion system	Processes the detected temperature by specified method.	-	0	
Scaling function	Converts a measured temperature value into a percent value (%) in set width.	-	0	
Pt100 cold junction compensation enable/disable setting function	Sets whether the cold junction compensation using the Pt100 attached to the terminal is performed or not.	-	0	
Offset/gain setting function	Performs linear correction by individually compensating any given 2 points (offset value/gain value) within the effective range.	-	0	
Error correction function	For all input ranges, the function allows compensating the temperature measurement value by part of the compensation value the errors compensation value.	0	-	Perform the error correction by the offset/gain setting of the Q64TD.
Online module replacement	Replaces a module without stopping the system.	-	0	Replaceable modules during online are the Process CPU and the Redundant CPU.

4.2.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals and sequence program, refer to the Thermocouple Input Module/Channel Isolated Thermocouple/Micro Voltage Input Module User's Manual.

	A61		Q64TD				
Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	Device No.	Signal name
X0	Watchdog timer error	Y0		X0	Module READY	Y0	Not used
X1	A/D conversion READY	Y1		X1	CH1 Offset/gain setting status signal	Y1	CH1 Offset setting request
X2	Error flag	Y2		X2	CH2 Offset/gain setting status signal	Y2	CH1 Gain setting request
Х3	Disconnection error detection	Y3		Х3	CH3 Offset/gain setting status signal	Y3	CH2 Offset setting request
X4	Digital output value out- of-range detection	Y4		X4	CH4 Offset/gain setting status signal	Y4	CH2 Gain setting request
X5	Detected temperature value out-of-range detection	Y5	Not used	X5		Y5	CH3 Offset setting request
X6		Y6		X6	Not used	Y6	CH3 Gain setting request
X7		Y7		X7		Y7	CH4 Offset setting request
X8		Y8		X8		Y8	CH4 Gain setting request
X9		Y9		X9	Operating condition setting completion signal	Y9	Operating condition setting request
XA		YA		XA	Offset/gain setting mode status flag	YA	User range write request
XB		YB		XB	Not used	YB	
XC		YC		XC	Disconnection detection signal	YC	Not used
XD		YD	Interlock signal for the	XD	Warning output signal	YD	Not used
XE		YE	RFRP and RTOP instructions when the	XE	Conversion completion flag	YE	
XF	Not used	YF	A616TD is used in remote I/O station	XF	Error flag	YF	Error clear request
X10		Y10	Detected temperature value LED display request signal				
X11		Y11					
X12		Y12					
X13 X14		Y13 Y14					
X15		Y15					
X16		Y16					
X17		Y17					
X18		Y18					
X19		Y19	Not used				
X1A X1B		Y1A Y1B					
X1C		Y1C					
X1D	Interlock signal for the	Y1D					
X1E	RFRP and RTOP	Y1E					
	instructions when the						
X1F	A616TD is used in	Y1F					
	remote I/O station			l			

4.2.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs. For details of buffer memories and sequence programs, refer to the Thermocouple Input Module/ Channel Isolated Thermocouple/Micro Voltage Input Module User's Manual.

	A616TD					
Address (hex)	Name	Read/write	Address (hex)	Q64TD Name	Read/write	
00	Data format selection		00	Conversion enable/disable setting		
01	Error code storage		01	CH1 Time/count averaging setting		
02	Error occurrence A60MX□CONNECT No. storage	R/W	02	CH2 Time/count averaging setting	R/W	
03	Thermocouple type setting error channel number storage		03	CH3 Time/count averaging setting		
04	Current sampling period storage	R	04	CH4 Time/count averaging setting		
05 to 0E	System area (Not used)	-	05 to 08	System area (Not used)	-	
0F	Conversion enable/ A616TD		09	Averaging processing selection	R/W	
10 to 17	disable specification Multiplexer module	R/W	0A	Conversion completion flag		
18	Setting data set request		0B	CH1 Measured temperature value		
19 to 1F	System area (Not used)	-	0C	CH2 Measured temperature value		
20 to 27	Disconnection detection enable/disable specification	R/W	0D	CH3 Measured temperature value	R	
28 to 2F	System area (Not used)	-	0E	CH4 Measured temperature value		
30 to 3F	Digital output value temperature setting		0F to 12	System area (Not used)	-	
40 to 47	Disconnection detection channel number storage	R/W	13	Error code	R	
48 to 4F	System area (Not used)	-	14	Setting range		
	Digital output value out-of-range	5	15 to 2E	System area (Not used)	-	
50 to 57	Channel number storage	R/W	2F	Warning output enable/disable setting	R/W	
58 to 5F	System area (Not used)	-	30	Warning output flag		
00.4- 07	Detected temperature value out-of-range	D.444	31	Disconnection detection flag		
60 to 67	Channel number storage	R/W	32	CH1 Scaling value		
68 to 6F	System area (Not used)	-	33	CH2 Scaling value	R	
70 to 7F	INPUT channel	R	34	CH3 Scaling value		
70107F	Digital output value storage	, K	35	CH4 Scaling value]	
80 to FF	Error correction value setting	R/W	36 to 3D	System area (Not used)		
100 to 17F	Thermocouple type setting	IN/VV	3E	CH1 Scaling range lower limit value		
180 to 1FF	MX CH.channel		3F	CH1 Scaling range upper limit value		
100 to 11 1	Digital output value storage	R	40	CH2 Scaling range lower limit value		
200 to 27F	MX CH.channel	1	41	CH2 Scaling range upper limit value	R/W	
200 to 271	Detected temperature value storage		42	CH3 Scaling range lower limit value	1000	
			43	CH3 Scaling range upper limit value		
			44	CH4 Scaling range lower limit value		
			45	CH4 Scaling range upper limit value		
			46 to 4D	System area (Not used)	-	
			4E	CH1 Scaling width lower limit value]	
			4F	CH1 Scaling width upper limit value	1	
			50	CH2 Scaling width lower limit value	_	
			51	CH2 Scaling width upper limit value	1	
			52	CH3 Scaling width lower limit value	R/W	
			53	CH3 Scaling width upper limit value	1	
			54	CH4 Scaling width lower limit value	-	
			55	CH4 Scaling width upper limit value	4	
			56	CH1 Warning output lower/lower limit value	4	
			57	CH1 Warning output lower/upper limit value		

Address (hex)		
(hex)	Nama	Read/write
	Name	Reau/Wille
58 (CH1 Warning output upper/lower limit value	
59	CH1 Warning output upper/upper limit value	
5A (CH2 Warning output lower/lower limit value	
5B (CH2 Warning output lower/upper limit value	
5C (CH2 Warning output upper/lower limit value	
5D (CH2 Warning output upper/upper limit value	
5E (CH3 Warning output lower/lower limit value	R/W
5F (CH3 Warning output lower/upper limit value	1000
60	CH3 Warning output upper/lower limit value	
61 (CH3 Warning output upper/upper limit value	
62	CH4 Warning output lower/lower limit value	
63	CH4 Warning output lower/upper limit value	
64	CH4 Warning output upper/lower limit value	
65	CH4 Warning output upper/upper limit value	
66 to 75	System area (Not used)	-
76	CH1 Offset temperature setting value	
77	CH1 Gain temperature setting value	
78	CH2 Offset temperature setting value	
79	CH2 Gain temperature setting value	R/W
7A (CH3 Offset temperature setting value	FC/ V V
7B (CH3 Gain temperature setting value	
7C (CH4 Offset temperature setting value	
7D (CH4 Gain temperature setting value	
7E to 9D 9	System area (Not used)	-
9E to 9F	Mode switching setting	
A0 (CH1 Factory default offset value	
A1 (CH1 Factory default gain value	
A2 (CH1 User range settings offset value	
A3 (CH1 User range settings gain value	
A4 (CH1 User range settings thermal (L)	
A5 E	EMF offset value (H)	
A6 (CH1 User range settings thermal (L)	
A7 E	EMF gain value (H)	
A8 (CH2 Factory default offset value	R/W
A9 (CH2 Factory default gain value	
AA (CH2 User range settings offset value	
AB (CH2 User range settings gain value	
AC (CH2 User range settings thermal (L)	
AD E	EMF offset value (H)	
AE (CH2 User range settings thermal (L)	
AF E	EMF gain value (H)	
B0 (CH3 Factory default offset value	
B1 (CH3 Factory default gain value	

Q64TD						
Address (hex)	Name	Read/write				
B2	CH3 User range settings offset value					
B3	CH3 User range settings gain value					
B4	CH3 User range settings thermal(L)					
B5	EMF offset value(H)					
B6	CH3 User range settings thermal(L)					
B7	EMF gain value(H)					
B8	CH4 Factory default offset value	R/W				
B9	CH4 Factory default gain value	FX/VV				
BA	CH4 User range settings offset value					
BB	CH4 User range settings gain value					
BC	CH4 User range settings thermal(L)					
BD	EMF offset value(H)					
BE	CH4 User range settings thermal(L)					
BF	EMF gain value(H)					
C0	System area (Not used)					
to	System area (Not used)	_				

4.3 A616TD (Replacement to the Q68TD-G-H02, Q68TD-G-H01)

4.3.1 Performance comparison

(1) Performance comparison list

	Item	A616TD (When using the A60MXT and A60MXTN together)	
Tempera	ature sensor input	-200 to 1800°C	
	Digital output value	16-bit signed binary	
Output	Digital output value	(0 to 4000) (Data part: 12 bits)	
Output	Detected	16-bit signed binary	
	temperature value	(-2000 to 18000: value up to the first decimal place × 10)	
Applicab	ole thermocouple	Refer to Section 4.3.1 (2).	
Measure	ed temperature range y	Refer to Section 4.3.1 (2).	
Overall	accuracy	Refer to the table in Section 4.3.1 (2).	
Overalla	accuracy	Measured temperature range accuracy ±0.5°C	
Maximur	m conversion speed	50ms/channel	
Isolation	ı method	Between the input terminal and programmable controller power supply: photocoupler isolation Between channels: non-isolation (1M Ω resistor isolation)	
Disconne	ection detection	Available	
	of temperature sensor	15 points/module (A60MXT, A60MXTN)	
input poi	ints	(The A60MXT and A60MXTN can be mounted up to seven in total to one A616TD.)	
Number	of occupied I/O points	32 points	
Eutomod.		(I/O assignment: special 32 points)	
	device connector	38-point terminal block	
	parately)	-	
(3010 36)	paratery)	0.75 to 2mm ²	
Applicab	ole wire size	(Applicable tightening torque: 39 to 59N•cm)	
Applicab	ole solderless terminal	V1.25-3, V1.25-YS3A, V2-YS3A	
	current consumption		
(5VDC)	ourient consumption	1.0A	
Weight		0.85kg	

O : Compatible, \triangle : Partial change required, \star : Incompatible

					O . Compatible,	2. I ditial change required, incompatible
	Q68TD-G-H02	Q serie	es Q68TD-G-	H01 ^{*1}	Compatibility	Precautions for replacement
		-270 to 182	20°C		0	
	16-bit s	igned binary	(Scaling value)		0	
	(-2700 to 18200: v	16-bit signed	l binary e first decimal place >	< 10)	0	
	Refer to Section 4.3.1 (2).			Δ	As they depend on the applicable thermocouple and thermocouple standard, refer to Section 4.3.1 (2) and check the specifications. Use the thermocouple that can be used on the Q68TD-G-H02/H01.	
	Refer to Section 4.3.1 (2).				Δ	As they depend on the applicable thermocouple and measured
		*2			0	temperature range, refer to Section 4.3.1 (2) to check the specifications.
	640ms/8 channels*3		320ms/8 cha	annels ^{*3}	0	
	Isolated area Between thermocouple input and programmable controller power supply Between thermocouple input channels Between cold junction compensation input (Pt100) and programmable	Isolation method Transformer isolation Transformer isolation	AC500Vms/1min AC1000Vrms/1min	Insulation resistance DC500V 10MΩ or more	0	
	controller power supply Available (all the channels are indeper	ndent)	Not avail	able	×	The Q68TD-G-H01 has the disconnection monitor function.
		1	ected to Pt100/modul	le	×	Consider replacement with multiple Q68TD-G-H02/H01.
	(I/O assi	16 poin gnment: intel	ts ligent 16 points)		Δ	The number of occupied I/O points has changed to 16 points.
		40-pin conr	×			
	A6CON4 0.3mm ² (22 AWG) or less				×	Wiring change is required.
					×	Thing shange is required.
		<u>-</u>			×	
	0.65A		0.49		0	
	0.22kg		0.18k	g	0	

- *1 Restrictions on mountable slot position apply to the Q68TD-G-H01. For details, refer to the user's manual for the Q68TD-G-H01/H02.
- *2 Calculate the accuracy in the following method.
 - (Accuracy) = (Conversion accuracy) + (Temperature characteristics) × (Operating ambient temperature variation)
 - + (Cold junction compensation accuracy)
 - An operating ambient temperature variation indicates a deviation of the operating ambient temperature from the 25±5°C range.
- *3 A measured temperature value is stored in the buffer memory at every 320ms/640ms, regardless of the number of conversion enable channels.

(2) Applicable thermocouple and measured temperature range accuracy

	A616TD							
				Measurement range	1	2	3	4
JIS	ANSI	DIN	BS	number			,	•
313	ANOI	DIN	В	Allowable input voltage	-12.5 to 12.5	0 to 25	0 to 50	0 to 100
				range [mV]	-12.5 to 12.5	0 10 23	0 10 30	0 10 100
				Measured temperature	100 to 1500	100 to 1800	100 to 1800	100 to 1800
В	В	_	PtRh30-	range [°C]	100 to 1500	100 to 1000	100 to 1000	100 to 1000
Б		_	PtRh6	Accuracy at 25°C [%]	_	±0.5	_	_
				Temperature drift [%/°C]		±0.013		
				Measured temperature	0 to 1000	0 to 1700	0 to 1700	0 to 1700
R	R	_	PtRh13-Pt	range [°C]	0 10 1000	0 10 17 00	0 10 17 00	0 10 17 00
10		_	1 (((1))-1 (Accuracy at 25°C [%]	_	±0.4	_	_
				Temperature drift [%/°C]		±0.011		
				Measured temperature	0 to 1200	0 to 1700	0 to 1700	0 to 1700
S	S	PtRh-Pt	PtRh10-Pt	range [°C]	0 10 1200	0 10 17 00	0 10 17 00	
· ·			1 4411011	Accuracy at 25°C [%]	_	±0.4	_	_
				Temperature drift [%/°C]		±0.011		
	К	K NiCr-Ni	i NiCr-NiAl	Measured temperature	-200 to 250	0 to 500	0 to 1000	0 to 1300
K				range [°C]				
				Accuracy at 25°C [%]	±0.4	±0.3	±0.3	±0.5
				Temperature drift [%/°C]	±0.011	±0.01	±0.01	±0.013
	E	-	NiCr-CuNi	Measured temperature	-200 to 150	0 to 300	0 to 600	0 to 1000
Е				range [°C]				
				Accuracy at 25°C [%]	±0.4	±0.3	±0.3	±0.4
				Temperature drift [%/°C]	±0.011	±0.01	±0.01	±0.011
		J -	- Fe-CuNi	Measured temperature	-200 to 200			0 to 1200
J	J			range [°C]				
				Accuracy at 25°C [%]	±0.4	±0.3	±0.3	±0.4
				Temperature drift [%/°C]	±0.011	±0.01	±0.01	±0.011
				Measured temperature	-200 to 200	0 to 400	0 to 400	0 to 400
Т	Т	-	Cu-CuNi	range [°C]				
				Accuracy at 25°C [%]	±0.5	±0.3	-	-
				Temperature drift [%/°C]	±0.013	±0.01		
				Measured temperature	-100 to 200	0 to 400	0 to 800	0 to 900
-	-	Fe-CuNi	-	range [°C]		.00	.00	.0.5
				Accuracy at 25°C [%]	-	±0.3	±0.3	±0.5
				Temperature drift [%/°C]		±0.01	±0.01	±0.013
				Measured temperature	-100 to 200	0 to 400	0 to 600	0 to 600
-	-	Cu-CuNi	-	range [°C]		10.0	10.4	
				Accuracy at 25°C [%]	-	±0.3	±0.4	-
				Temperature drift [%/°C]		±0.01	±0.011	

Q68TD-G-H02, Q68TD-G-H01						
Applicable thermocouple type	Measured temperature range ^{*1}	Conversion accuracy (at operating ambient temperature 25±5°C)	Temperature characteristics (per operating ambient temperature variation of 1°C)	Maximum temperature error at ambient temperature of 55°C		
	0 to 600°C	*3	*3	*3		
В	600 to 800°C*2	±3.0°C	.0.400	±13.0°C		
В	800 to 1700°C*2	±2.5°C	±0.4°C	±12.5°C		
	1700 to 1820°C	*3	*3	*3		
	-50 to 0°C	*3	*3	*3		
5	0 to 300°C*2	±2.5°C	±0.4°C	±12.5°C		
R	300 to 1600°C*2	±2.0°C	±0.3°C	±9.5°C		
	1600 to 1760°C	*3	*3	*3		
	-50 to 0°C	*3	*3	*3		
0	0 to 300°C*2	±2.5°C	±0.4°C	±12.5°C		
S	300 to 1600°C*2	±2.0°C	±0.3°C	±9.5°C		
	1600 to 1760°C	*3	*3	*3		
	-270 to -200°C	*3	*3	*3		
К	-200 to 0°C*2	Larger value of ±0.5°C or ±0.5% of measured temperature	Larger value of ±0.06°C or ±0.2% of measured temperature	±11.0°C		
Λ.	0 to 1200°C*2	Larger value of ±0.5°C or ±0.25% of measured temperature	Larger value of ±0.06°C or ±0.02% of measured temperature	±9.0°C		
	1200 to 1370°C	*3	*3	*3		
	-270 to -200°C	*3	*3	*3		
E	-200 to 0°C*2	Larger value of ±0.5°C or ±0.5% of measured temperature	Larger value of ±0.06°C or ±0.15% of measured temperature	±8.5°C		
E	0 to 900°C*2	Larger value of ±0.5°C or ±0.25% of measured temperature	Larger value of ±0.06°C or ±0.02% of measured temperature	±6.75°C		
	900 to 1000°C	*3	*3	*3		
	-210 to -40°C	*3	*3	*3		
J	-40 to 750°C*2	Larger value of ±0.5°C or ±0.25% of measured temperature	Larger value of ±0.06°C or ±0.02% of measured temperature	±5.625°C		
	750 to 1200°C	*3	*3	*3		
	-270 to -200°C	*3	*3	*3		
т	-200 to 0°C*2	Larger value of ±0.5°C or ±0.5% of measured temperature	Larger value of ±0.06°C or ±0.1% of measured temperature	±6.0°C		
,	0 to 350°C*2	Larger value of ±0.5°C or ±0.25% of measured temperature	Larger value of ±0.06°C or ±0.02% of measured temperature	±2.625°C		
	350 to 400°C	*3	*3	*3		
	-270 to -200°C	*3	*3	*3		
N.	-200 to 0°C*2	Larger value of ±0.5°C or ±0.5% of measured temperature	Larger value of ±0.06°C or ±0.2% of measured temperature	±11.0°C		
N	0 to 1250°C*2	Larger value of ±0.5°C or ±0.25% of measured temperature	Larger value of ±0.06°C or ±0.02% of measured temperature	±9.375°C		
	1250 to 1300°C	*3	*3	*3		

^{*1} If a value entered from the thermocouple is outside the measured temperature range given in the table, it is handled as the maximum/minimum value of the measured temperature range.

^{*2} The accuracy only in the temperature ranges of Class 1 to 3 (shaded areas) in JIS C1602-1995 apply. Also, a warm-up (power distribution) period of 30 minutes is required to satisfy with the accuracy.

^{*3} A temperature can be measured; however, the accuracy is not guaranteed.

4.3.2 Functional comparison

O : Available, \triangle : Partial change required, - : Not available

ltem	Description	A616TD	Q68TD-G- H02/H01	Precautions for replacement
Temperature conversion function	Imports temperature data.	0	0	
Conversion enable/disable	Sets whether to enable/disable a	_	_	
function	conversion per channel.	0	0	
Disconnection detection function	Detects a disconnection of the connected thermocouple of each channel.	0	Δ	The Q68TD-G-H01 does not have the disconnection detection function. Use the disconnection monitor function instead.
Temperature conversion value storage	Stores imported temperature data in the buffer memory.	0	0	
Input type selection function	Sets an input type for each channel.	0	0	For the Q68TD-G-H02/H01, this function is set with the intelligent function module switch setting.
Warning output function	Outputs a warning when the temperature exceeds the set temperature range.	-	0	
Temperature conversion system	Processes the detected temperature by specified method.	-	0	
Scaling function	Converts a measured temperature value into a percent value (%) in set width.	-	0	
Pt100 cold junction compensation enable/disable setting function	Sets whether the cold junction compensation using the Pt100 attached to the terminal is performed or not.	-	0	
Offset/gain setting function	Performs linear correction by individually compensating any given 2 points (offset value/gain value) within the effective range.	-	0	
Error correction function	For all input ranges, the function allows compensating the temperature measurement value by part of the compensation value the errors compensation value.	0	-	Perform the error correction by the offset/gain setting of the Q68TD-G-H02/H01.
Online module replacement	Replaces a module without stopping the system.	-	0	Replaceable modules during online are the Process CPU and the Redundant CPU.

4.3.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals and sequence program, refer to the Thermocouple Input Module/Channel Isolated Thermocouple/Micro Voltage Input Module User's Manual.

	A61		Q68TD-G-H02, Q68TD-G-H01				
Device	Signal name	Device	Signal name	Device	Signal name	Device	Signal name
No. X0		No. Y0		No. X0	Module READY	No. Y0	
X1	Watchdog timer error A/D conversion READY	Y1		X1	Wodule READT	Y1	-
X2	Error flag	Y2		X2		Y2	
Х3	Disconnection error detection	Y3		Х3		Y3	
X4	Digital output value out- of-range detection	Y4		X4		Y4	Not used
X5	Detected temperature value out-of-range detection	Y5		X5	Not used	Y5	, not used
X6		Y6		X6		Y6	
X7		Y7		X7		Y7	
X8		Y8	Not used	X8		Y8	
X9		Y9		X9	Operating condition setting completion flag	Y9	Operating condition setting request
XA		YA		XA	Offset/gain setting mode status flag	YA	User range write request
ХВ		YB		XB	Channel change completion flag	YB	Channel change request
XC		YC		хс	Q68TD-G-H02: Disconnection detection signal Q68TD-G-H01: Disconnection status monitor signal	YC	Not used
XD		YD	Interlock signal for the	XD	Warning output signal	YD	
XE	Not used	YE	RFRP and RTOP instructions when the	XE	Conversion completion flag	YE	
XF		YF	A616TD is used in remote I/O station	XF	Error flag	YF	Error clear request
X10		Y10	Detected temperature value LED display request signal				
X11		Y11					
X12	_	Y12					
X13		Y13					
X14 X15	-	Y14 Y15					
X16		Y16					
X17	-	Y17					
X18		Y18					
X19		Y19	Not used				
X1A		Y1A					
X1B	1	Y1B					
X1C		Y1C					
X1D	Interlock signal for the	Y1D					
X1E	RFRP and RTOP	Y1E					
	instructions when the						
X1F	A616TD is used in	Y1F					
	remote I/O station			J			

4.3.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs. For details of buffer memories and sequence programs, refer to the Thermocouple Input Module/ Channel Isolated Thermocouple/Micro Voltage Input Module User's Manual.

	A61	6TD			Q68TD-G-H02, Q68TD-G-H01			
Address (hex)	Nar	me	Read/write	Address (hex)	Name	Read/write		
00	Data format selection			00	Conversion enable/disable setting			
01	Error code storage	torage		ode storage		01 to 08	CH1 to CH8 Time/count/moving average/ time constant setting	R/W
02	Error occurrence A60MX□CONNECT No. storage		R/W	09	System area (Not used)	-		
03	Thermocouple type setting error channel number storage			0A	Conversion completion flag			
04	Current sampling perio	od storage	R	0B to 12	CH1 to CH8 Measured temperature value			
05 to 0E	System area (Not used	d)	-	13	Error code	R		
0F		A616TD	- R/W	14 to 15	CH1 to CH8 Setting range (Thermocouple type)			
10 to 17	disable specification	Multiplexer module	TC/VV	16	Setting range (Offset/gain setting)			
18	Setting data set reque	st		17	System area (Not used)	-		
19 to 1F	System area (Not used	d)	-	18 to 19	CH1 to CH8 Averaging processing selection			
20 to 27	Disconnection detection specification	on enable/disable	R/W	1A	Offset/gain setting mode (Offset specification)			
28 to 2F	System area (Not used	System area (Not used)		1B	Offset/gain setting mode (Gain specification)	R/W		
30 to 3F	Digital output value ter	mperature setting		1C	CH1 Offset temperature setting value	1		
40 to 47	Disconnection detection channel number storage		R/W	1D	CH1 Gain temperature setting value			
48 to 4F	System area (Not used	d)	-		to	I		
E0 to E7	Digital output value out-of-range		DAM	2B	CH8 Gain temperature setting value	R/W		
50 to 57	Channel number stora	ge	R/W	2C	System area (Not used)	-		
58 to 5F	System area (Not used	stem area (Not used)		2D	Q68TD-G-H02:Cold junction compensation setting state	R		
	,	•			Q68TD-G-H01: System area	-		
	Detected temperature	value out-of-range		2E	Warning output enable/disable setting	R/W		
60 to 67	Channel number stora	_	R/W	2F	Warning output flag (Process alarm)			
68 to 6F	System area (Not used	d)	-	30	Warning output flag (Rate alarm)			
					Q68TD-G-H02:Disconnection detection flag	_		
70 to 7F	INPUT channel	NPUT channel Digital output value storage		31	Q68TD-G-H01:Disconnection status	R		
70 to 7F	Digital output value sto				monitor flag			
				32 to 39	CH1 to CH8 Scaling value			
80 to FF	Error correction value	setting	R/W	3A	Scaling valid/invalid setting	R/W		
100 to 17F	Thermocouple type se	tting	17///	3B to 3D	System area (Not used)	-		
180 to 1FF	MX CH.channel			3E	CH1 Scaling range lower limit value	R/W		
100 to 111	Digital output value sto	orage	R	3F	CH1 Scaling range upper limit value	10,00		
200 to 27F	MX CH.channel		1.		to			
200 to 271	Detected temperature	value storage		4D	CH8 Scaling range upper limit value			
				4E	CH1 Scaling width lower limit value	R/W		
				4F	CH1 Scaling width upper limit value			
	to			1				
				5D	CH8 Scaling width upper limit value			
				5E	CH1 Process alarm lower/lower limit value	R/W		
				5F	CH1 Process alarm lower/upper limit value			
				60	CH1 Process alarm upper/lower limit value			

Q68TD-G-H02, Q68TD-G-H01					
Address (hex)	Name	Read/write			
61	CH1 Process alarm upper/upper limit value	R/W			
	to	l			
7D	CH8 Process alarm upper/upper limit value				
7E to 85	CH1 to CH8 Rate alarm warning detection period	R/W			
86	CH1 Rate alarm upper limit value				
87	CH1 Rate alarm lower limit value				
	to				
95	CH8 Rate alarm lower limit value	R/W			
96 to 9D	System area	-			
9E to 9F	Mode switching setting	R/W			
A0 to A3	System area (Not used)	-			
	Q68TD-G-H02:Conversion setting for				
A 4 4 - A 5	disconnection detection				
A4 to A5	Q68TD-G-H01:Disconnection state				
	conversion setting				
	Q68TD-G-H02:Conversion setting value for	R/W			
AC += AD	disconnection detection				
A6 to AD	Q68TD-G-H01:Conversion setting value for	r			
	disconnection state				
AE to BD	System area (Not used)	-			
BE	CH1 Factory default offset value				
BF	CH1 Factory default gain value				
C0	CH1 User range settings offset value				
C1	CH1 User range settings gain value				
C2	CH1 User range settings thermal EMF offset				
62	value (L)	R/W			
Ca	CH1 User range settings thermal EMF offset	R/W			
C3	value (H)				
C4	CH1 User range settings thermal EMF gain				
C4	value (L)				
C5	CH1 User range settings thermal EMF gain				
CS					
to					
FC	CH8 User range settings thermal EMF gain				
10	value (L)	R/W			
FD	CH8 User range settings thermal EMF gain	17/44			
10	value (H)				

4.4 A68RD3N (Replacement to the Q64RD)

4.4.1 Performance comparison

Item		A68RD3N				
Measuring meth	nod	3-wire type				
		16-bit signed binary				
		-1800 to 6000				
Output (tempera	ature	Value up to the first decimal place × 10				
conversion valu	ie)	32-bit signed binary				
		-180000 to 600000				
		Value up to the third decimal place × 1000				
		Pt100				
Applicable plati	num DTD	(JIS C1604-1997, IEC 751-am2, JIS C1604-1989, DIN 43760-1980)				
Applicable plati	IIIIII KID	JPt100				
		(JIS C1604-1981)				
Measured	Pt100	-180 to 600°C				
temperature	11100	$(27.10 \text{ to } 313.71\Omega)$				
range	JPt100	-180 to 600°C				
Tarigo	01 1100	$(25.80 \text{ to } 317.28\Omega)$				
Accuracy		±1%				
		(accuracy at full scale)				
Resolution		0.025°C				
Conversion speed		40ms/channel				
Number of anal	og input points	8 channels/module				
Output current f	for temperature	1mA				
detection						
Isolation metho	d	Between platinum RTD input and programmable controller power supply: photocoupler isolation				
		Between platinum RTD input and channel: non-isolation				
Dielectric withstand voltage		Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute				
Disconnection of	detection	Detected per channel				
Number of occu	inied I/O noints	32 points				
Number of occupied I/O points		(I/O assignment: special 32 points)				
External connec	-	38-point terminal block				
Applicable wire	size	0.75 to 2mm ²				
Applicable sold	erless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A				

O : Compatible, \triangle : Partial change required, \star : Incompatible

	O. Compatible,	△ : Partial change required, ×: incompatible
Q64RD	Compatibility	Precautions for replacement
3/4-wire type	0	
16-bit signed binary -2000 to 8500 Value up to the first decimal place × 10 32-bit signed binary -200000 to 850000	0	
Value up to the third decimal place × 1000 Pt100 (JIS C 1604-1997, IEC751 1983) JPt100 (JIS C 1604-1981)	Δ	As the compliance standards for the applicable platinum RTD differ, change the platinum RTD to the one that can be used with the Q64RD.
-200 to 850°C -180 to 600°C	0	
Ambient temperature 0 to 55°C: ±0.25% (accuracy relative to maximum value) Ambient temperature 25±5°C: ±0.08% (accuracy relative to maximum value)	0	
0.025°C	0	
40ms/channel	0	
4 channels/module	Δ	Consider replacement with multiple Q64RD.
1mA	0	
Isolated area Isolation method Dielectric withstand voltage Insulation resistance	0	
Detected per channel	0	
16 points (I/O assignment: intelligent 16 points)	Δ	The number of occupied I/O points has changed to 16 points.
18-point terminal block	×	
0.3 to 0.75mm ²	×	Wiring change is required.
1.25-3, R1.25-3 (Sleeved solderless terminal cannot be used.)	×	J J 17

Item	A68RD3N	
Cables between module and platinum RTD	Make sure that the conductor resistance value between the Pt100 and A68RD3N is 10Ω or less per conductor. All channels become the same specifications.	
Internal current consumption (5VDC)	0.94A	
Weight	0.43kg	

 $O \colon Compatible, \triangle \colon Partial \ change \ required, \ \times \colon Incompatible$

Q64RD	Compatibility	Precautions for replacement	
The conductor resistance value must meet the condition of 1) + 2) \leq 2k Ω or less. (In the case of 3-conductor type, the difference between 1) and 2) in the conductor resistance value must be 10 Ω or less.)	0		
0.60A	0		
0.17kg	0		

4.4.2 Functional comparison

O: Available, -: Not available

Item	Description	A68RD3N	Q64RD	Precautions for replacement
Conversion enable/disable specification of each channel	Enables/disables a detection of temperature.	0	0	
Sampling/averaging processing selection	Processes the detected temperature by specified method.	0	0	The setting ranges of time and count averages differ. Refer to the RTD Input Module/ Channel Isolated RTD Input Module User's Manual to check the specifications.
Detected temperature value storage	Stores temperature data in the buffer memory.	0	0	
Disconnection detection	Detects a disconnection of connected platinum RTD or a cable.	0	0	
Specification of platinum RTD type	Specifies a platinum RTD type used.	0	0	
Range switching function	Switches the measured temperature range.	-	0	
Warning output function	Outputs a warning when the temperature exceeds the set temperature range.	-	0	
Scaling function	Converts a measured temperature value into a percent value (%) in set width.	-	0	
Error correction function	Corrects an error in temperature conversion value.	0	0	Perform the error correction by the offset/gain setting of the Q64RD.
Online module replacement	Replaces a module without stopping the system.	-	0	Replaceable modules during online are the Process CPU and the Redundant CPU.

4.4.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals and sequence program, refer to the RTD Input Module/Channel Isolated RTD Input Module User's Manual.

	A68RD3N			Q64RD				
Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	
X0	Watchdog timer error flag	Y0		X0	Module READY	Y0	Not used	
X1	READY flag	Y1		X1	CH1 Offset/gain setting status signal	Y1	CH1 Offset setting request	
X2	Write data error flag	Y2		X2	CH2 Offset/gain setting status signal	Y2	CH1 Gain setting request	
Х3	CH1: Disconnection detection flag	Y3		Х3	CH3 Offset/gain setting status signal	Y3	CH2 Offset setting request	
X4	CH2: Disconnection detection flag	Y4		X4	CH4 Offset/gain setting status signal	Y4	CH2 Gain setting request	
X5	CH3: Disconnection detection flag	Y5		X5		Y5	CH3 Offset setting request	
X6	CH4: Disconnection detection flag	Y6	Not used	X6	Natura	Y6	CH3 Gain setting request	
X7	CH5: Disconnection detection flag	Y7		X7	Not used	Y7	CH4 Offset setting request	
X8	CH6: Disconnection detection flag	Y8		X8		Y8	CH4 Gain setting request	
X9	CH7: Disconnection detection flag	Y9		X9	X9 Operating condition setting completion signal		Operating condition setting request	
XA	CH8: Disconnection detection flag	YA		XA	Offset/gain setting mode status flag	YA	User range write request	
XB		YB		XB	Not used	YB		
XC		YC		XC	Disconnection detection signal	YC	Not used	
XD		YD	Interlock signal for the	XD	Warning output signal	YD		
XE		YE	RFRP and RTOP instructions when the	XE	Conversion completion flag	YE		
XF		YF	A68RD3N is used in remote I/O station	XF	Error flag	YF	Error clear request	
X10		Y10	Not used					
X11	Natural	Y11	Francisco de vecet fles					
X12 X13	Not used	Y12 Y13	Error code reset flag					
X14		Y14						
X15		Y15						
X16		Y16						
X17		Y17						
X18		Y18						
X19		Y19						
X1A		Y1A	Not used					
X1B X1C		Y1B Y1C						
X1D	Interlock signal for the	Y1D						
X1E	RFRP and RTOP	Y1E						
	instructions when the							
X1F	A68RD3N is used in	Y1F						
	remote I/O station							

4.4.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs. For details of the buffer memories and sequence program, refer to the RTD Input Module/Channel Isolated RTD Input Module User's Manual.

	A68RD3N			Q64RD	
Address (decimal)	Name	Read/write	Address (decimal)	Name	Read/write
0	Conversion enable/disable specification		0	Conversion enable/disable specification	
1	Averaging processing selection		1	CH1 Time/count averaging setting	
2	CH1 Averaging time/count		2	CH2 Time/count averaging setting	R/W
3	CH2 Averaging time/count		3	CH3 Time/count averaging setting	
4	CH3 Averaging time/count		4	CH4 Time/count averaging setting	
5	CH4 Averaging time/count	R/W	5		
6	CH5 Averaging time/count		6		
7	CH6 Averaging time/count		7	System area (Not used)	-
8	CH7 Averaging time/count		8		
9	CH8 Averaging time/count		9	Averaging processing selection	R/W
10	CH1 Detected temperature value (16bit)		10	Conversion completion flag	
11	CH2 Detected temperature value (16bit)		11	CH1 Measured temperature value (16bit)	
12	CH3 Detected temperature value (16bit)		12	CH2 Measured temperature value (16bit)	R
13	CH4 Detected temperature value (16bit)		13	CH3 Measured temperature value (16bit)	
14	CH5 Detected temperature value (16bit)		14	CH4 Measured temperature value (16bit)	
15	CH6 Detected temperature value (16bit)		15	The second temperature value (1001)	
16	CH7 Detected temperature value (16bit)	_	16		
17	CH8 Detected temperature value (16bit)	_	17	System area (Not used)	-
18	CH1 Detected temperature value (L)		18		
19	(32bit) (H)		19	Error code	
20	CH2 Detected temperature value (L)		20	Setting range	R
21	·		21	Jetting range	
22	(32bit) (H) CH3 Detected temperature value (L)	R	22		
	·				
23	(32bit) (H)		23		
24	CH4 Detected temperature value (L)		24		
25	(32bit) (H)		25		
26	CH5 Detected temperature value (L)		26		
27	(32bit) (H)		27		
28	CH6 Detected temperature value (L)		28		
29	(32bit) (H)		29		
30	CH7 Detected temperature value (L)		30		
31	(32bit) (H)		31		
32	CH8 Detected temperature value (L)		32		
33	(32bit) (H)	5	33	System area (Not used)	-
34	Write data error code	R/W	34		
35	Conversion completion flag	R	35		
36	Specification of platinum RTD type	R/W	36		
			37		
			38		
			39		
			40		
			41		
			42		
			43		
			44		
			45		
			46		
			47	Warning output enable/disable setting	R/W

	Q64RD	
Address	Name	Read/write
(decimal)		
48	Warning output flag	-
49	Disconnection detection flag	-
50 51	CH1 Scaling value CH2 Scaling value	-
52	CH3 Scaling value	+
53	CH4 Scaling value	-
54	CH1 Measured temperature value (L)	-
55	(32bit) (H)	R
56	CH2 Measured temperature value (L)	
57	(32bit) (H)	
58	CH3 Measured temperature value (L)	1
59	(32bit) (H)	
60	CH4 Measured temperature value (L)	-
61	(32bit) (H)	
62	CH1 Scaling range lower limit value (L)	
63	(H)	
64	CH1 Scaling range upper limit value (L)	1
65	(H)	
66	CH2 Scaling range lower limit value (L)	1
67	(H)	
68	CH2 Scaling range upper limit value (L)	-
69	(H)	
70	CH3 Scaling range lower limit value (L)	-
71	(H)	
72	CH3 Scaling range upper limit value (L)	-
73	(H)	
74	CH4 Scaling range lower limit value (L)	1
75	(H)	
76	CH4 Scaling range upper limit value (L)	1
77	(H)	D 04/
78	CH1 Scaling width lower limit value	R/W
79	CH1 Scaling width upper limit value	-
80	CH2 Scaling width lower limit value	-
81	CH2 Scaling width upper limit value	
82	CH3 Scaling width lower limit value	1
83	CH3 Scaling width upper limit value	1
84	CH4 Scaling width lower limit value	
85	CH4 Scaling width upper limit value	1
86	CH1 Warning output lower (L)	1
87	lower limit value (H)	
88	CH1 Warning output lower (L)	1
89	upper limit value (H)	
90	CH1 Warning output upper (L)	
91	lower limit value (H)	
92	CH1 Warning output upper (L)	1
93	upper limit value (H)	
	to	1
116	CH4 Warning output upper (L)	
117	upper limit value (H)	
118	CH1 Offset temperature setting value (L)	5
119	(H)	R/W
120	CH1 Gain temperature setting value (L)	1
121	(H)	
	to	1

Q64RD				
Address (decimal)	Name	Read/write		
132	CH4 Gain temperature setting value (L)	R/W		
133	(H)	10.00		
134 to 157	Not used	-		
158	Mode switching setting	R/W		
159	wode switching setting			
160	3-conductor type CH1 Factory default			
100	offset value			
to				
254	4-conductor type CH4 User range (L)	R/W		
255	settings gain resistance value (H)	FK/VV		

4.5 A68RD3N (Replacement to the Q64RD-G)

4.5.1 Performance comparison

Item		A68RD3N			
Measuring met	hod	3-wire type			
		16-bit signed binary			
		-1800 to 6000			
Output (temperature		Value up to the first decimal place × 10			
conversion valu	ue)	32-bit signed binary			
		-180000 to 600000			
		Value up to the third decimal place × 1000			
		DMOO			
		Pt100 (JIS C1604-1997, IEC 751-am2, JIS C1604-1989, DIN 43760-1980)			
Applicable RTD)	(313 C1004-1997, IEC 731-a1112, 313 C1004-1969, DIN 43760-1960) JPt100			
		(JIS C1604-1981)			
		(310 0 1004-1301)			
	Pt100	-180 to 600°C			
Measured	P1100	$(27.10 \text{ to } 313.71\Omega)$			
temperature	JPt100	-180 to 600°C			
range	31 1100	$(25.80 \text{ to } 317.28\Omega)$			
	Ni100	<u>-</u>			
Accuracy		±1%			
		(accuracy at full scale)			
Resolution		0.025°C			
Conversion spe	eed	40ms/channel			
Number of ana	log input points	8 channels/module			
Output current	for temperature	1mA			
detection					
Isolation metho	od	Between platinum RTD input and programmable controller power supply: photocoupler isolation			
		Between platinum RTD input and channel: non-isolation	4		
Dielectric withs	tand voltage	Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute			
Disconnection detection		Detected per channel	+		
Number of	unied I/O = sist	32 points			
Number of occ	upied I/O points	(I/O assignment: special 32 points)			
External conne	ction system	38-point terminal block			
Applicable wire	size	0.75 to 2mm ²			
Applicable sold	lerless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A			

O : Compatible, \triangle : Partial change required, \star : Incompatible

				9: Compatible, 2: Fartial change required, 4: Incompatible		
Q64RD-G			Compatibility	Precautions for replacement		
3/4-	0					
-200	igned binary 0 to 8500					
	Value up to the first decimal place × 10					
32-bit s	0					
-20000						
·	d decimal place × 1000					
	Pt100					
-	997, IEC751 1983)			As the compliance standards for the		
	Pt100		Δ	applicable RTD differ, change the RTD to the one that can be used with		
·	1604-1981) Ni100			the Q64RD-G.		
	3760 1987)			THE QUARD-G.		
(Dil44	3700 1907)					
-200	to 850°C					
	to 600°C		0			
-60	to 180°C					
	*1		0			
0.	025°C		0			
40m:	s/channel		0			
4 chan	nels/module		Δ	Consider replacement with multiple Q64RD-G.		
	1mA		0			
Isolated area Isolation method	Dielectric withstand voltage	Insulation resistance				
Between RTD input and programmable controller power supply		10MΩ or more using 500VDC insulation	0			
Between RTD Transform input and channel isolation		resistance tester				
Detected	0					
16 points				The number of occupied I/O points		
	intelligent 16 points)	Δ	has changed to 16 points.			
18-point	×					
-	0.75mm ²		×	Military all and the second second		
	3, R1.25-3			Wiring change is required.		
	erminal cannot be used.)		×			

^{*1} Indicates accuracy of the Q64RD-G (accuracy at the maximum value in the selection range).

	Accuracy	Specifications		
Reference accuracy		Within 0.04%		
	Pt100/JPt100 (-20 to 120°C)	±70ppm/°C (±0.0070%/°C)		
Temperature coefficient	Pt100/JPt100 (0 to 200°C)	±65ppm/°C (±0.0065%/°C)		
remperature coemicient	Pt100/JPt100 (-200 to 850°C)	±50ppm/°C (±0.0050%/°C)		
	Ni100Ω (-60 to 180°C)	±70ppm/°C (±0.0070%/°C)		

Item	A68RD3N	
Cable between module and RTD	Make sure that the conductor resistance value between the Pt100 and A68RD3N is 10Ω or less per conductor. All channels become the same specifications. $ \begin{array}{c c} 10\Omega \text{ or less} \\ \hline & 10\Omega or les$	
Internal current consumption (5VDC)	0.94A	
Weight	0.43kg	

O : Compatible, \triangle : Partial change required, \times : Incompatible

Q64RD-G	Compatibility	Precautions for replacement
The conductor resistance value must meet the condition of 1) + 2) \leq 2k Ω or less. (In the case of 3-conductor type, the difference between 1) and 2) in the conductor resistance value must be 10 Ω or less.)		
Pt100 B1 b1 SLD Conductor Q64RD-G	0	
2) A1 B1 b1 SLD		
0.62A	0	
0.20kg	0	

4.5.2 Functional comparison

O: Available, -: Not available

Item	Description	A68RD3N	Q64RD-G	Precautions for replacement
Conversion enable/disable	Enables/disables a detection of	0	0	
specification of each channel	temperature.	O)	
Sampling/averaging processing selection	Processes the detected temperature by specified method.	0	0	The setting ranges of time and count averages differ. Refer to the RTD Input Module/ Channel Isolated RTD Input Module User's Manual to check the specifications.
Detected temperature value storage	Stores temperature data in the buffer memory.	0	0	
Disconnection detection	Detects a disconnection of the connected RTD or cable.	0	0	
Specification of RTD type	Specifies a RTD type used.	0	0	
Range switching function	Switches the measured temperature range.	-	0	
Warning output function	Outputs a warning when the temperature exceeds the set temperature range.	-	0	
Scaling function	Converts a measured temperature value into a percent value (%) in set width.	-	0	
Error correction function	Corrects an error in temperature conversion value.	0	0	Perform the error correction by the offset/gain setting of the Q64RD-G.
Online module replacement	Replaces a module without stopping the system.	-	0	Replaceable modules during online are the Process CPU and the Redundant CPU.

4.5.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals and sequence program, refer to the RTD Input Module/Channel Isolated RTD Input Module User's Manual.

	A68F	RD3N			Q64	RD-G	
Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	Device No.	Signal name
X0	Watchdog timer error flag	Y0		X0	Module READY	Y0	Not used
X1	READY flag	Y1		X1	CH1 Offset/gain setting status signal	Y1	CH1 Offset setting request
X2	Write data error flag	Y2		X2	CH2 Offset/gain setting status signal	Y2	CH1 Gain setting request
Х3	CH1: Disconnection detection flag	Y3		Х3	CH3 Offset/gain setting status signal	Y3	CH2 Offset setting request
X4	CH2: Disconnection detection flag	Y4		X4	CH4 Offset/gain setting status signal	Y4	CH2 Gain setting request
X5	CH3: Disconnection detection flag	Y5		X5	-	Y5	CH3 Offset setting request
X6	CH4: Disconnection detection flag	Y6	Not used	X6	National	Y6	CH3 Gain setting request
X7	CH5: Disconnection detection flag	Y7		X7	Not used	Y7	CH4 Offset setting request
X8	CH6: Disconnection detection flag	Y8		X8		Y8	CH4 Gain setting request
X9	CH7: Disconnection detection flag	Y9		X9	Operating condition setting completion signal	Y9	Operating condition setting request
XA	CH8: Disconnection detection flag	YA		XA	Offset/gain setting mode status flag	YA	User range write request
XB		YB		XB	Not used	YB	
XC		YC		XC	Disconnection detection signal	YC	Not used
XD		YD	Interlock signal for the	XD	Warning output signal	YD	Not useu
XE		YE	RFRP and RTOP instructions when the	XE	Conversion completion flag	YE	
XF		YF	A68RD3N is used in remote I/O station	XF	Error flag	YF	Error clear request
X10		Y10	Not used				
X11	Natural	Y11	Francisco de vecet fles				
X12 X13	Not used	Y12 Y13	Error code reset flag				
X14		Y14					
X15		Y15					
X16		Y16					
X17		Y17					
X18		Y18					
X19		Y19					
X1A		Y1A	Not used				
X1B X1C		Y1B Y1C					
X1D	Interlock signal for the	Y1D					
X1E	RFRP and RTOP	Y1E					
	instructions when the						
X1F	A68RD3N is used in	Y1F					
	remote I/O station						

4.5.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs. For details of the buffer memory and sequence program, refer to the RTD Input Module/Channel Isolated RTD Input Module User's Manual.

Address (decimal)	Name		Address		
		Read/write	(decimal)	Name	Read/write
	Conversion enable/disable specification		0	Conversion enable/disable setting	
	Averaging processing selection		1	CH1 Time/count/moving averaging setting	
	CH1 Averaging time/count		2	CH2 Time/count/moving averaging setting	R/W
	CH2 Averaging time/count		3	CH3 Time/count/moving averaging setting	
	CH3 Averaging time/count		4	CH4 Time/count/moving averaging setting	
5	CH4 Averaging time/count	R/W	5		
6	CH5 Averaging time/count		4-	Countries - Trans. (Nat. var. et l.)	
7	CH6 Averaging time/count		to	System area (Not used)	-
8	CH7 Averaging time/count		8		
9	CH8 Averaging time/count		9	Averaging processing selection	R/W
10	CH1 Detected temperature value (16bit)		10	Conversion completion flag	
11	CH2 Detected temperature value (16bit)		11	CH1 Measured temperature value (16bit)	
12	CH3 Detected temperature value (16bit)		12	CH2 Measured temperature value (16bit)	R
13	CH4 Detected temperature value (16bit)		13	CH3 Measured temperature value (16bit)	
14	CH5 Detected temperature value (16bit)		14	CH4 Measured temperature value (16bit)	
15	CH6 Detected temperature value (16bit)		15		
16	CH7 Detected temperature value (16bit)		to	Cystem area (Net yeard)	
17	CH8 Detected temperature value (16bit)		to	System area (Not used)	_
18	CH1 Detected temperature value(L)		18		
19	(32bit)(H)		19	Error code	
20	CH2 Detected temperature value (L)		20	Setting range 1	R
	(32bit) (H)		21	Setting range 2	
22	CH3 Detected temperature value (L)	R	22		
	(32bit) (H)		23		
24	CH4 Detected temperature value (L)		24		
	(32bit) (H)		25		
	CH5 Detected temperature value (L)		26		
	(32bit) (H)		27		
	CH6 Detected temperature value (L)	-	28		
	(32bit) (H)		29		
	CH7 Detected temperature value (L)	-	30		
	(32bit) (H)		31		
	CH8 Detected temperature value (L)		32		
	(32bit) (H)		33		
	Write data error code	R/W	34	System area (Not used)	-
	Conversion completion flag	R	35		
	Specification of platinum RTD type	R/W	36		
00	opeomodicit of platificati TCTD type	1077	37		
			38		
			39		
			40		
			41		
			42		
			43		
			44		
			45		
			46		

	Q64RD-G						
Address	Name	Read/write					
(decimal)	Name	rtead/write					
48	Warning output flag						
49	Disconnection detection flag						
50 to 53	CH1 to CH4 Scaling value	R					
54	CH1 Measured temperature value (L)						
55	(32bit) (H)						
	to	T					
60	CH4 Measured temperature value (L)	R					
61	(32bit) (H)						
62	CH1 Scaling range lower limit value (L)						
63	(H)	R/W					
64	CH1 Scaling range upper limit (L)						
65	65 value (H)						
	to						
76	CH4 Scaling range upper limit (L)						
77	value (H)	R/W					
78	CH1 Scaling width lower limit value						
79	CH1 Scaling width upper limit value						
	to						
85	CH4 Scaling width upper limit value						
86	CH1 Warning output lower (L)	1					
87	lower limit value (H)						
88	CH1 Warning output lower (L)						
89	upper limit value (H)	R/W					
90	CH1 Warning output upper (L)						
91	lower limit value (H)						
92	CH1 Warning output upper (L)						
93	upper limit value (H)						
	to						
116	CH4 Warning output upper (L)						
117	upper limit value (H)						
118	CH1 Offset temperature setting (L)	D					
119	value (H)	R/W					
120	CH1 Gain temperature setting (L)	1					
121	value (H)						
	to	•					
132	CH4 Gain temperature setting (L)						
133	value (H)	R/W					
134	Extended averaging processing selection	1					
135 to	Custom area (Net uses:1)						
147	System area (Not used)	-					
4.10	Conversion setting for disconnection	D.444					
148	detection	R/W					
149	System area (Not used)	-					
	<u>'</u>						

	Q64RD-G	
Address	Marria	Do a diferentia
(decimal)	Name	Read/write
150	CH1 Conversion setting value for (L)	R/W
151	disconnection detection (H)	K/VV
	to	
156	CH4 Conversion setting value for (L)	
157	disconnection detection (H)	
158	Mode switching setting	
159	Mode switching setting	
160	3-conductor type CH1 Factory (L)	
161	default offset value (H)	
162	3-conductor type CH1 Factory (L)	
163	default gain value (H)	
164	3-conductor type CH1 User range (L)	
165	settings offset value (H)	
166	3-conductor type CH1 User range (L)	
167	settings gain value (H)	
168	3-conductor type CH1 User range (L)	
169	settings offset resistance value (H)	D 0.47
170	3-conductor type CH1 User range (L)	R/W
171	settings gain resistance value (H)	
172	4-conductor type CH1 Factory (L)	
173	default offset value (H)	
174	4-conductor type CH1 Factory (L)	
175	default gain value (H)	
176	4-conductor type CH1 User range (L)	
177	settings offset value (H)	
178	4-conductor type CH1 User range (L)	
179	settings gain value (H)	
180	4-conductor type CH1 User range (L)	
181	settings offset resistance value (H)	
182	4-conductor type CH1 User range (L)	1
183	settings gain resistance value (H)	
	to	
254	4-conductor type CH4 User range (L)	R/W
255	settings gain resistance value (H)	K/VV

4.6 A68RD3N (Replacement to the Q68RD3-G)

4.6.1 Performance comparison

Item		A68RD3N				
Measuring met	thod	3-wire type				
		16-bit signed binary				
Output (temperature conversion value) Applicable RTD Measured temperature range Pt100 JPt100 Ni100 Accuracy Resolution Conversion speed		-1800 to 6000				
		Value up to the first decimal place × 10				
		32-bit signed binary				
		-180000 to 600000				
		Value up to the third decimal place × 1000				
		Pt100				
Applicable RTD		(JIS C1604-1997, IEC 751-am2, JIS C1604-1989, DIN 43760-1980)				
		(313 C1004-1997, IEC 731-alli2, 313 C1004-1909, DIN 43700-1900) JPt100				
		(JIS C1604-1981)				
		(010 01004 1001)				
	Pt100	-180 to 600°C				
		(27.10 to 313.71Ω)				
	JPt100	-180 to 600°C				
range		(25.80 to 317.28Ω)				
	Ni100	- 140/				
Accuracy		±1%				
•		(accuracy at full scale) 0.025°C				
Resolution		0.025 C				
Conversion speed		40ms/channel				
Number of analog input points		8 channels/module				
	for temperature	1mA				
detection		Between platinum RTD input and programmable controller power supply: photocoupler isolation				
Isolation metho	od	Between platinum RTD input and programmable controller power supply. photocoupler isolation				
Dielectric withstand voltage		Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute				
Disconnection detection		Detected per channel				
Number of occ	upied I/O points	32 points				
		(I/O assignment: special 32 points)				
External conne	-	38-point terminal block				
External device		<u>-</u>				
(sold separatel		0.75 0. 2				
Applicable wire		0.75 to 2mm ²				
Applicable solo	derless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A				

O : Compatible, \triangle : Partial change required, \star : Incompatible

JPt100 applicable RTD differ, change the RTD to the one that can be used with the Q68RD3-G. (DIN 43760 1987) -200 to 850°C -180 to 600°C O *1 O 0.1°C Δ The resolution reduces. The conversion speed is fixed at		O: Compatible,	△ : Partial change required, ×: incompatible
16-bit signed binary -2000 to 8500 Value up to the first decimal place × 10 P1100 (JIS C 1604-1997, IEC751 1983) JP1100 (JIS C 1604-1981) N100 (DIN 43760 1987) -200 to 850°C -180 to 680°C -180 to 680°C -190 to 850°C -180 to 680°C -180 to 6	Q68RD3-G	Compatibility	Precautions for replacement
-2000 to 8500 Value up to the first decimal place × 10 Pt100 (JIS C 1604-1997, IEC751 1983) JP1100 (JIS C 1604-1997, IEC751 1983) JP1100 (JIS C 1604-1981) Ni100 (DIN 43760 1987) -200 to 850°C -180 to 600°C -60 to 180°C -11 O 1-10 0.1°C -60 to 180°C -71 O -71 O The resolution reduces. The conversion speed is fixed at 320ms/6 channels 8 channels/module -71 -72 -73 -74 -75 -75 -75 -75 -75 -75 -75	3-wire type	0	
As the compliance standards for the applicable RTD differ, change the RTD to the one that can be used with the Q68RD3-G. Compliance Standards for the applicable RTD differ, change the RTD to the one that can be used with the Q68RD3-G. Compliance Standards for the applicable RTD to the one that can be used with the Q68RD3-G. Compliance Standards for the applicable RTD to the one that can be used with the Q68RD3-G. Compliance Standards for the applicable RTD to the one that can be used with the Q68RD3-G. Compliance Standards for the applicable RTD to the one that can be used with the Q68RD3-G. Compliance Standards for the applicable RTD to the one that can be used with the Q68RD3-G. Compliance Standards for the applicable RTD to the one that can be used with the Q68RD3-G. Compliance Standards for the applicable RTD to the one that can be used with the Q68RD3-G. Compliance Standards for the applicable RTD to the one that can be used with the Q68RD3-G. Compliance Standards for the applicable RTD to the one that can be used with the Q68RD3-G. Compliance Standards for the applicable RTD to the one that can be used with the Q68RD3-G. Compliance Standards for the applicable RTD to the one that can be used with the Q68RD3-G. Compliance Standards for the applicable RTD to the one that can be used with the Q68RD3-G. Compliance Standards for the applicable RTD to the one that can be used with the Q68RD3-G. Compliance Standards for the applicable RTD to the one that can be used with the Q68RD3-G. Compliance Standards for the applicable RTD to the one that can be used with the Q68RD3-G. Compliance Standards for the applicable RTD to the one that can be used with the Q68RD3-G. Compliance Standards for the applicable RTD the one that can be used with the Q68RD3-G. Compliance Standards for the RTD the one that can be used with the Q68RD3-G. Compliance Standards for the RTD the one that can be used with the Q68RD3-G. Compliance Standards for the RTD the one that can	-2000 to 8500	Δ	32-bit output is not available.
-180 to 600°C -60 to 180°C -11 O The resolution reduces. The conversion speed is fixed at 320ms/8 channels A 320ms/8 channels B channels/module O ImA O Isolated area Isolation method Dielectric withstand Insulation resistance The conversion speed is fixed at 320ms, regardless of the number of enable channels.	(JIS C 1604-1997, IEC751 1983) JPt100 (JIS C 1604-1981) Ni100	Δ	RTD to the one that can be used with
180 to 600°C 190°C 190°	-200 to 850°C		
1 0.1°C	-180 to 600°C	0	
0.1°C	-60 to 180°C		
The conversion speed is fixed at 320ms, regardless of the number of enable channels.	*1	0	
320ms/8 channels	0.1°C	Δ	The resolution reduces.
Isolated area Isolation method Dielectric withstand voltage resistance Between RTD input and programmable controller power supply Between RTD Transformer 1000VACrms Between RTD Transformer 1000VACrms testance Insulation resistance more using 500VDC insulation resistance testance	320ms/8 channels	Δ	320ms, regardless of the number of
Isolated area Isolation method Dielectric withstand voltage Insulation resistance	8 channels/module	0	
Between RTD Input and programmable controller power supply Between RTD Transformer 1000VACrms 10MΩ or more using 500VDC insulation Input and programmable controller power supply Between RTD Transformer 1000VACrms Input and programmable controller isolation Input and programmable controller	1mA	0	
tester	Between RTD input and programmable controller power supply Transformer isolation 500VACrms 10MΩ or more using 500VDC insulation registance	0	
	tootou		
Detected per channel O	 ·	0	
16 points (I/O assignment: intelligent 16 points) The number of occupied I/O points has changed to 16 points.	(I/O assignment: intelligent 16 points)	Δ	has changed to 16 points.
40-pin connector × Wiring change is required.	40-pin connector	×	Wiring change is required.
A6CON4 × Prepare the A6CON4 separately.	A6CON4	×	Prepare the A6CON4 separately.
0.3 mm ² ×	0.3 mm ²	×	
- x	-	×	

Item	A68RD3N	
Cables between module and RTD	Make sure that the conductor resistance value between the Pt100 and A68RD3N is 10Ω or less per conductor. All channels become the same specifications. $ \begin{array}{c c} 10\Omega \text{ or less} \\ \hline & 10\Omega or les$	
Internal current consumption (5VDC)	0.94A	
Weight	0.43kg	

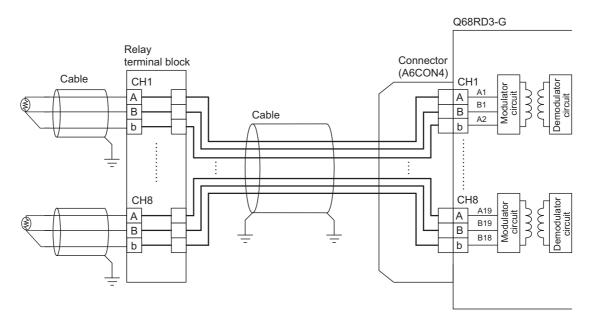
 $O: Compatible, \triangle: Partial \ change \ required, \ \times: Incompatible$

Q68RD3-G	Compatibility	Precautions for replacement
*2	Δ	Install a relay terminal block outside.
0.54A	0	
0.20kg	0	

^{*1} Accuracy of the Q68RD3-G for each RTD type is as follows.

Conversion accuracy		Specifications
	-200 to 850°C*1	±0.8°C (Ambient temperature: 25±5°C), ±2.4°C (Ambient temperature: 0 to 55°C)
Pt100	-20 to 120°C*1	±0.3°C (Ambient temperature: 25±5°C), ±1.1°C (Ambient temperature: 0 to 55°C)
	0 to 200°C*1	±0.4°C (Ambient temperature: 25±5°C), ±1.2°C (Ambient temperature: 0 to 55°C)
	-180 to 600°C*1	±0.8°C (Ambient temperature: 25±5°C), ±2.4°C (Ambient temperature: 0 to 55°C)
JPt100	-20 to 120°C*1	±0.3°C (Ambient temperature: 25±5°C), ±1.1°C (Ambient temperature: 0 to 55°C)
	0 to 200°C*1	±0.4°C (Ambient temperature: 25±5°C), ±1.2°C (Ambient temperature: 0 to 55°C)
Ni100	-60 to 180°C*1	±0.4°C (Ambient temperature: 25±5°C), ±1.2°C (Ambient temperature: 0 to 55°C)

*2 Connect cables between the Q68RD3-G and RTD using a relay terminal block as shown below.



4.6.2 Functional comparison

O: Available, -: Not available

Item	Description	A68RD3N	Q68RD3-G	Precautions for replacement
Conversion enable/disable	Enables/disables a detection of	0	0	
specification of each channel	temperature.	O	O	
Sampling/averaging processing selection	Processes the detected temperature by specified method.	0	0	The setting ranges of time and count averages differ. Refer to the RTD Input Module/ Channel Isolated RTD Input Module User's Manual to check the specifications.
Detected temperature value storage	Stores temperature data in the buffer memory.	0	0	
Disconnection detection	Detects a disconnection of the connected RTD or cable.	0	0	
Specification of RTD type	Specifies a RTD type used.	0	0	
Range switching function	Switches the measured temperature range.	-	0	
Warning output function	Outputs a warning when the temperature exceeds the set temperature range.	-	0	
Scaling function	Converts a measured temperature value into a percent value (%) in set width.	-	0	
Error correction function	Corrects an error in temperature conversion value.	0	0	Perform the error correction by the offset/gain setting of the Q68RD3-G.
Online module replacement	Replaces a module without stopping the system.	-	0	Replaceable modules during online are the Process CPU and the Redundant CPU.

4.6.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals and sequence program, refer to the RTD Input Module/Channel Isolated RTD Input Module User's Manual.

	A68RD3N				Q68RD3-G			
Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	
X0	Watchdog timer error flag	Y0		X0	Module READY	Y0		
X1	READY flag	Y1		X1		Y1		
X2	Write data error flag	Y2		X2		Y2		
Х3	CH1: Disconnection detection flag	Y3		Х3		Y3		
X4	CH2: Disconnection detection flag	Y4		X4		Y4		
X5	CH3: Disconnection detection flag	Y5		X5	Not used	Y5	Not used	
X6	CH4: Disconnection detection flag	Y6		X6		Y6		
X7	CH5: Disconnection detection flag	Y7	Not used	X7		Y7		
X8	CH6: Disconnection detection flag	Y8		X8		Y8		
Х9	CH7: Disconnection detection flag	Y9		Х9	Operating condition setting completion flag	Y9	Operating condition setting request	
XA	CH8: Disconnection detection flag	YA		XA	Offset/gain setting mode status flag	YA	User range write request	
ХВ		YB		XB	Channel change completion flag	YB	Channel change request	
XC		YC		XC	Disconnection detection signal	YC		
XD		YD	Interlock signal for the	XD	Warning output signal	YD	Not used	
XE		YE	RFRP and RTOP instructions when the	XE	Conversion completion flag	YE		
XF		YF	A68RD3N is used in remote I/O station	XF	Error flag	YF	Error clear request	
X10		Y10	Not used					
X11	Not used	Y11						
X12		Y12	Error code reset flag					
X13		Y13						
X14		Y14						
X15 X16		Y15 Y16						
X10		Y17						
X17		Y18						
X19		Y19						
X1A		Y1A	Not used					
X1B		Y1B						
X1C	1	Y1C						
X1D	Interlock signal for the	Y1D						
X1E	RFRP and RTOP	Y1E						
	instructions when the							
X1F	A68RD3N is used in	Y1F						
	remote I/O station							

4.6.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs. For details of the buffer memory and sequence program, refer to the RTD Input Module/Channel Isolated RTD Input Module User's Manual.

	A68RD3N			Q68RD3-G	
Address (decimal)	Name	Read/write	Address (decimal)	Name	Read/write
0	Conversion enable/disable specification		0	Conversion enable/disable setting	
1	Averaging processing selection		1	CH1 Time/count/moving average/time constant setting	
2	CH1 Averaging time/count		2	CH2 Time/count/moving average/time constant setting	
3	CH2 Averaging time/count		3	CH3 Time/count/moving average/time constant setting	
4	CH3 Averaging time/count	DAM	4	CH4 Time/count/moving average/time constant setting	R/W
5	CH4 Averaging time/count	- R/W	5	CH5 Time/count/moving average/time constant setting	
6	CH5 Averaging time/count		6	CH6 Time/count/moving average/time constant setting	
7	CH6 Averaging time/count		7	CH7 Time/count/moving average/time constant setting	
8	CH7 Averaging time/count		8	CH8 Time/count/moving average/time constant setting	
9	CH8 Averaging time/count		9	System area (Not used)	-
10	CH1 Detected temperature value (16bit)		10	Conversion completion flag	
11	CH2 Detected temperature value (16bit)		11	CH1 Measured temperature value	
12	CH3 Detected temperature value (16bit)		12	CH2 Measured temperature value	
13	CH4 Detected temperature value (16bit)		13	CH3 Measured temperature value	
14	CH5 Detected temperature value (16bit)		14	CH4 Measured temperature value	
15	CH6 Detected temperature value (16bit)		15	CH5 Measured temperature value	
16	CH7 Detected temperature value (16bit)		16	CH6 Measured temperature value	R
17	CH8 Detected temperature value (16bit)		17	CH7 Measured temperature value	
18	CH1 Detected temperature value (L)		18	CH8 Measured temperature value	
19	(32bit) (H)		19	Error code	
20	CH2 Detected temperature value (L)	R	20	Setting range 1 (Input type CH1-4)	
21	(32bit) (H)		21	Setting range 2 (Input type CH5-8)	
22	CH3 Detected temperature value (L)		22	Setting range 3 (Offset/gain setting)	
23	(32bit) (H)		23	System area (Not used)	-
24	CH4 Detected temperature value (L)		24	Averaging processing selection (CH1-CH4)	
25	(32bit) (H)		25	Averaging processing selection (CH5-CH8)	
26	CH5 Detected temperature value (L) (32bit) (H)		26	Offset/gain setting mode (Offset specification)	
27	` '	4	27	Offset/gain setting mode (Gain specification)	1
28	CH6 Detected temperature value (L)		28	CH1 Offset temperature setting value	1
29	(32bit) (H)		29	CH1 Gain temperature setting value	1
30	CH7 Detected temperature value (L)		30	CH2 Offset temperature setting value	
31	(32bit) (H)	R	31	CH2 Gain temperature setting value	R/W
32	CH8 Detected temperature value (L)		32	CH3 Offset temperature setting value	4
33	(32bit) (H)	DAA	33	CH3 Gain temperature setting value	-
34	Write data error code	R/W	34	CH4 Offset temperature setting value	4
35	Conversion completion flag	R	35	CH4 Gain temperature setting value	4
36	Specification of platinum RTD type	R/W	36	CH5 Offset temperature setting value	-
			37	CHS Offset temperature setting value	1
			38	CH6 Offset temperature setting value	-
			39	CH6 Gain temperature setting value	

	Q68RD3-G				
Address (decimal)	Name	Read/write			
40	CH7 Offset temperature setting value				
41	CH7 Gain temperature setting value	R/W			
42	CH8 Offset temperature setting value	17/44			
43	CH8 Gain temperature setting value				
44 to 45	System area (Not used)	-			
46	Warning output enable/disable setting	R/W			
47	Warning output flag (Process alarm)				
48	Warning output flag (Rate alarm)	R			
49	Disconnection detection flag				
50 to 57	CH1 to CH8 Scaling value				
58	Scaling valid/invalid setting	R/W			
59 to 61	System area (Not used)	-			
62	CH1 Scaling range lower limit value	R/W			
63	CH1 Scaling range upper limit value				
	to	,			
77	CH8 Scaling range upper limit value				
78	CH1 Scaling width lower limit value	R/W			
79	CH1 Scaling width upper limit value				
	to	,			
93	CH8 Scaling width upper limit value				
94	CH1 Process alarm lower/lower limit value				
95	CH1 Process alarm lower/upper limit value	R/W			
96	CH1 Process alarm upper/lower limit value				
97	CH1 Process alarm upper/upper limit value				
125	to	 			
125	CH8 Process alarm upper/upper limit value				
126 to 133	CH1 to CH8 Rate alarm warning detection	R/W			
134	period				
135	CH1 Rate alarm upper limit value CH1 Rate alarm lower limit value				
133	to				
149	CH8 Rate alarm lower limit value	R/W			
	System area (Not used)	-			
	Mode switching setting	R/W			
	System area (Not used)	-			
100 to 100	Conversion setting for disconnection				
164	detection (CH1-CH4)				
	Conversion setting for disconnection				
165	detection (CH5-CH8)	R/W			
	CH1 to CH8 Conversion setting value for	1			
166 to173	disconnection detection				
174 to 189	System area	-			
190	CH1 Factory default offset value				
191	CH1 Factory default gain value				
192	CH1 User range settings offset value				
193	CH1 User range settings gain value	F 44.			
194	CH1 User range settings offset (L)	R/W			
195	resistance value (H)				
196	196 CH1 User range settings gain (L)				
197	resistance value (H)				
	to				
050	CH8 User range settings gain resistance	DAA'			
253	value (H)	R/W			
		•			

4.7 A68RD4N (Replacement to the Q64RD)

4.7.1 Performance comparison

Measuring method	It	em	A68RD4N		
1800 to 8000 1	Measuring met	thod	4-wire type		
Output (temperature conversion value) Value up to the first decimal place × 10 32-bit signed binary 1-180000 to 600000 Value up to the third decimal place × 1000 Pt100 Applicable platinum RTD Applicable platinum RTD (JIS C1604-1997, IEC 751-am2, JIS C1604-1989, DIN 43780-1980) JPt100 (JIS C1604-1997, IEC 751-am2, JIS C1604-1989, DIN 43780-1980) JPt100 (JIS C1604-1981) -180 to 600°C (27.10 to 313.710) -180 to 600°C (25.80 to 317.280) Accuracy \$1% (accuracy at full scale) Resolution 0.025°C Conversion speed 40ms/channel Number of analog input points Output current for temperature election Isolation method Between platinum RTD input and programmable controller power supply: photocoupler isolation Between platinum RTD input and channel: non-isolation Dielectric withstand voltage Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute Disconnection detection Batch-detected at all channels (V/O assignment: special 32 points) External connection system 38-point terminal block Applicable wire size 0.75 to 2mm²			16-bit signed binary		
conversion value) 32-bit signed binary -180000 to 800000 Value up to the third decimal place × 1000 P1100 (JIS C1604-1997, IEC 751-am2, JIS C1604-1999, DIN 43760-1980) JP1100 (JIS C1604-1999, DIN 43760-1980) JP1100 4889, DIN 43760-1980) JP1100 489, DIN 43760-1980 489, DIN 43760-1980 489, DIN 43760-1980 489, DIN			-1800 to 6000		
Applicable platinum RTD	Output (tempe	rature	Value up to the first decimal place × 10		
Applicable platinum RTD Applicable platinum RTD (JIS C1604-1997, IEC 751-am2, JIS C1604-1989, DIN 43760-1980) JPt100 (JIS C1604-1997, IEC 751-am2, JIS C1604-1989, DIN 43760-1980) JPt100 (JIS C1604-1981) -180 to 600°C (27.10 to 313.71(1) -180 to 600°C (25.80 to 317.28(1)) Accuracy \$\frac{\pmathrm{\frac{21}{21}}{\pmathrm{\frac{21}{21}	conversion val	ue)			
Applicable platinum RTD (JIS C1604-1997, IEC 751-agx_JIS C1604-1989, DIN 43760-1980) JPt100 (JIS C1604-1981) Measured temperature range Pt100 1-80 to 600°C (25.80 to 317.28C1) Accuracy 1-180 to 600°C (25.80 to 317.28C1) Accuracy at full scale) Resolution 0.025°C Conversion speed 40ms/channel Number of analog input points 8 channels/module Output current for temperature detection Between platinum RTD input and programmable controller power supply: photocoupler isolation Between platinum RTD input and channel: non-isolation Dielectric withstand voltage Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute Disconnection detection Batch-detected at all channels 1/(10) assignment: special 32 points) External connection system 38-point terminal block Applicable wire size			-180000 to 600000		
Applicable platinum RTD (JIS C1604-1997, IEC 751-am2, JIS C1604-1989, DIN 43760-1980) JPt100 (JIS C1604-1981) Measured temperature range Pt100 Pt100 Pt100 Accuracy Pt100 Accuracy Accuracy Accuracy Accuracy Accuracy Accuracy Accuracy (accuracy at full scale) Resolution Conversion speed A 0ms/channel Number of analog input points Output current for temperature detection Isolation method Between platinum RTD input and programmable controller power supply: photocoupler isolation Between platinum RTD input and channel: non-isolation Dielectric withstand voltage Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute Disconnection detection Batch-detected at all channels 32 points (I/O assignment: special 32 points) External connection system 38-point terminal block Applicable wire size			Value up to the third decimal place × 1000		
Applicable platinum RTD JPH100 (JIS C1604-1981) -180 to 600°C (27.10 to 313.71Ω) temperature range JPH100 Accuracy Accuracy L180 to 600°C (25.80 to 317.28Ω) Accuracy L196 (accuracy at full scale) Resolution Conversion speed Aums/channel Number of analog input points Between platinum RTD input and programmable controller power supply: photocoupler isolation Between platinum RTD input and channel: non-isolation Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute Disconnection detection Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute Disconnection detection Batch-detected at all channels 32 points 32 points (I/O assignment: special 32 points) External connection system 38-point terminal block Applicable wire size					
Accuracy Pt100 180 to 800°C (27.10 to 313.71Ω)	Applicable plat	inum RTD			
Neasured temperature range Pt100 Temperature Pt100 Temperature Temperature range Pt100 Temperature Temperatur	Applicable plat				
Measured temperature range Pt100 (27.10 to 313.71Ω)		•			
Temperature range JPt100 JPt100 -180 to 600°C (25.80 to 317.28Ω) #1% (accuracy at full scale) Resolution O.025°C Conversion speed A0ms/channel Number of analog input points Output current for temperature detection Isolation method Between platinum RTD input and programmable controller power supply: photocoupler isolation Between platinum RTD input and channel: non-isolation Dielectric withstand voltage Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute Disconnection detection Batch-detected at all channels Number of occupied I/O points (I/O assignment: special 32 points) External connection system Applicable wire size O.75 to 2mm²	Measured	Pt100			
range JPt100 (25.80 to 317.28Ω) Accuracy ±1% (accuracy at full scale) Resolution 0.025°C Conversion speed 40ms/channel Number of analog input points 8 channels/module Output current for temperature detection Between platinum RTD input and programmable controller power supply: photocoupler isolation Between platinum RTD input and channel: non-isolation Dielectric withstand voltage Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute Disconnection detection Batch-detected at all channels Number of occupied I/O points (I/O assignment: special 32 points) External connection system 38-point terminal block Applicable wire size 0.75 to 2mm²					
Accuracy #1% (accuracy at full scale) Resolution 0.025°C Conversion speed 40ms/channel Number of analog input points 0utput current for temperature detection Between platinum RTD input and programmable controller power supply: photocoupler isolation Between platinum RTD input and channel: non-isolation Dielectric withstand voltage Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute Disconnection detection Batch-detected at all channels Number of occupied I/O points (I/O assignment: special 32 points) External connection system 38-point terminal block Applicable wire size 0.75 to 2mm²	•	JPt100			
Resolution 0.025°C Conversion speed 40ms/channel Number of analog input points Output current for temperature detection Isolation method Between platinum RTD input and programmable controller power supply: photocoupler isolation Between platinum RTD input and channel: non-isolation Dielectric withstand voltage Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute Disconnection detection Batch-detected at all channels 32 points (I/O assignment: special 32 points) External connection system Applicable wire size 0.75 to 2mm²			(25.80 to 317.28Ω)		
Resolution 0.025°C Conversion speed 40ms/channel Number of analog input points Output current for temperature detection Isolation method Between platinum RTD input and programmable controller power supply: photocoupler isolation Between platinum RTD input and channel: non-isolation Dielectric withstand voltage Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute Disconnection detection Batch-detected at all channels 32 points (I/O assignment: special 32 points) External connection system Applicable wire size 0.75 to 2mm²			140/		
Resolution 0.025°C Conversion speed 40ms/channel Number of analog input points 8 channels/module Output current for temperature detection Isolation method Between platinum RTD input and programmable controller power supply: photocoupler isolation Between platinum RTD input and channel: non-isolation Dielectric withstand voltage Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute Disconnection detection Batch-detected at all channels 32 points (I/O assignment: special 32 points) External connection system 38-point terminal block Applicable wire size 0.75 to 2mm²	Accuracy				
Conversion speed Number of analog input points 8 channels/module 1mA ledetection Between platinum RTD input and programmable controller power supply: photocoupler isolation Between platinum RTD input and channel: non-isolation Dielectric withstand voltage Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute Disconnection detection Batch-detected at all channels 32 points Number of occupied I/O points (I/O assignment: special 32 points) External connection system 38-point terminal block Applicable wire size			(accuracy at full Scale)		
Number of analog input points Output current for temperature detection Isolation method Between platinum RTD input and programmable controller power supply: photocoupler isolation Between platinum RTD input and channel: non-isolation Dielectric withstand voltage Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute Disconnection detection Batch-detected at all channels 32 points Number of occupied I/O points (I/O assignment: special 32 points) External connection system Applicable wire size 0.75 to 2mm²	Resolution		0.025°C	+	
Output current for temperature detection Solation method Between platinum RTD input and programmable controller power supply: photocoupler isolation Between platinum RTD input and channel: non-isolation	Conversion sp	eed	40ms/channel		
Solation method Between platinum RTD input and programmable controller power supply: photocoupler isolation Between platinum RTD input and channel: non-isolation	Number of ana	log input points	8 channels/module		
Dielectric withstand voltage Between platinum RTD input and channel: non-isolation Disconnection detection Batch-detected at all channels Number of occupied I/O points (I/O assignment: special 32 points) External connection system Applicable wire size Disconnection method Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute Batch-detected at all channels (I/O assignment: special 32 points) External connection system O.75 to 2mm²		for temperature	1mA		
Dielectric withstand voltage Between platinum RTD input and channel: non-isolation Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute Disconnection detection Batch-detected at all channels Number of occupied I/O points (I/O assignment: special 32 points) External connection system 38-point terminal block Applicable wire size 0.75 to 2mm²	Isolation mothe	od	Between platinum RTD input and programmable controller power supply: photocoupler isolation		
Disconnection detection Batch-detected at all channels 32 points (I/O assignment: special 32 points) External connection system 38-point terminal block Applicable wire size 0.75 to 2mm ²	isolation metric	od .	Between platinum RTD input and channel: non-isolation		
Number of occupied I/O points (I/O assignment: special 32 points) External connection system Applicable wire size 32 points (I/O assignment: special 32 points) 38-point terminal block 0.75 to 2mm²	Dielectric withstand voltage		Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute		
Number of occupied I/O points (I/O assignment: special 32 points) External connection system 38-point terminal block Applicable wire size 0.75 to 2mm ²	Disconnection detection		Batch-detected at all channels		
External connection system 38-point terminal block Applicable wire size 0.75 to 2mm ²	Number of occupied I/O points		32 points		
Applicable wire size 0.75 to 2mm ²	Number of occupied i/O points				
	External conne	ection system	· · · · · · · · · · · · · · · · · · ·		
Applicable solderless terminal V1.25-3, V1.25-YS3A, V2-YS3A	Applicable wire size		0.75 to 2mm ²		
	Applicable solo	derless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A		

O: Compatible, \triangle : Partial change required, \times : Incompatible

	O . Compatible,	△ : Partial change required, ×: incompatible
Q64RD	Compatibility	Precautions for replacement
3/4-wire type	0	
16-bit signed binary -2000 to 8500 Value up to the first decimal place × 10 32-bit signed binary data -200000 to 850000	0	
Value up to the third decimal place × 1000 Pt100 (JIS C 1604-1997, IEC751 1983) JPt100 (JIS C 1604-1981)	Δ	As the compliance standards for the applicable platinum RTD differ, change the platinum RTD to the one that can be used with the Q64RD.
-200 to 850°C -180 to 600°C	0	
Ambient temperature 0 to 55°C: ±0.25% (accuracy relative to maximum value) Ambient temperature 25±5°C: ±0.08% (accuracy relative to maximum value)	0	
0.025°C	0	
40ms/channel	0	
4 channels/module	Δ	Consider replacement with multiple Q64RD.
1mA	0	
Isolated area Isolation method Dielectric withstand voltage Insulation resistance	0	
Detected per channel	0	
16 points (I/O assignment: intelligent 16 points)	Δ	The number of occupied I/O points has changed to 16 points.
18-point terminal block	×	The shanged to 10 points.
0.3 to 0.75mm ²	×	Military also are in a service of
1.25-3, R1.25-3 (Sleeved solderless terminal cannot be used.)	×	Wiring change is required.

Item	A68RD4N	
Cable between module and platinum RTD	Set the total resistance value of a conductor where the current runs to 70Ω or less. Example: When connecting Pt100 to CH1 and CH2 Conductor a1 A68RD4N CH.1 Pt100 2)	
Internal current consumption (5VDC)	0.41A	
Weight	0.43kg	

 $O \colon Compatible, \triangle \colon Partial \ change \ required, \ \times \colon Incompatible$

Q64RD	Compatibility	Precautions for replacement
The conductor resistance value must meet the condition of 1) + 2) \leq 2k Ω or less. (In the case of 3-conductor type, the difference between 1) and 2) in the conductor resistance value must be 10 Ω or less.)	Compatibility	Precautions for replacement
2) A1 B1 b1 sLD		
0.60A	Δ	The recalculation of internal current consumption (5VDC) is required.
0.17kg	0	

4.7.2 Functional comparison

O: Available, -: Not available

Item	Description	A68RD4N	Q64RD	Precautions for replacement
Conversion enable/disable specification of each channel	Enables/disables a detection of temperature.	0	0	
Sampling/averaging processing selection	Processes the detected temperature by specified method.	0	0	The setting ranges of time and count averages differ. Refer to the RTD Input Module/ Channel Isolated RTD Input Module User's Manual to check the specifications.
Detected temperature value storage	Stores temperature data in the buffer memory.	0	0	
Disconnection detection	This function detects connected platinum RTD or cable breakage.	0	0	For the Q64RD, a disconnection is detected per channel.
Specification of platinum RTD type	Specifies a platinum RTD type used.	0	0	
Range switching function	Switches the measured temperature range.	-	0	
Warning output function	Outputs a warning when the temperature exceeds the set temperature range.	-	0	
Scaling function	Converts a measured temperature value into a percent value (%) in set width.	-	0	
Error correction function	Corrects an error in temperature conversion value.	0	0	Perform the error correction by the offset/gain setting of the Q64RD.
Online module replacement	Replaces a module without stopping the system.	-	0	Replaceable modules during online are the Process CPU and the Redundant CPU.

4.7.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals and sequence program, refer to the RTD Input Module/Channel Isolated RTD Input Module User's Manual.

	A68F	RD4N	Q64RD				
Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	Device No.	Signal name
X0	Watchdog timer error flag	Y0		X0	Module READY	Y0	Not used
X1	READY flag	Y1		X1	CH1 Offset/gain setting status signal	Y1	CH1 Offset setting request
X2	Write data error flag	Y2		X2	CH2 Offset/gain setting status signal	Y2	CH1 Gain setting request
Х3	Σ disconnection detection flag (CH1 to CH8)	Y3		Х3	CH3 Offset/gain setting status signal	Y3	CH2 Offset setting request
X4		Y4		X4	CH4 Offset/gain setting status signal	Y4	CH2 Gain setting request
X5		Y5	Not used	X5		Y5	CH3 Offset setting request
X6		Y6		X6	Not used	Y6	CH3 Gain setting request
X7		Y7		X7	Not used	Y7	CH4 Offset setting request
X8		Y8		X8		Y8	CH4 Gain setting request
X9		Y9		X9	Operating condition setting completion signal	Y9	Operating condition setting request
XA		YA		XA	Offset/gain setting mode status flag	YA	User range write request
XB		YB		XB	Not used	YB	
XC		YC		XC	Disconnection detection signal	YC	Not used
XD		YD	Interlock signal for the	XD	Warning output signal	YD	Not used
XE	Not used	YE	RFRP and RTOP instructions when the	XE	Conversion completion flag	YE	
XF		YF	A68RD4N is used in remote I/O station	XF	Error flag	YF	Error clear request
X10		Y10	Not used				
X11		Y11					
X12 X13		Y12 Y13	Error code reset flag				
X13		Y14					
X15		Y15					
X16		Y16					
X17		Y17					
X18		Y18					
X19		Y19					
X1A		Y1A	Not used				
X1B X1C		Y1B Y1C					
X1D	Interlock signal for the	Y1D					
X1E	RFRP and RTOP	Y1E					
, , , <u>_</u>	instructions when the						
X1F	A68RD4N is used in	Y1F					
	remote I/O station						

4.7.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs. For details of the buffer memory and sequence program, refer to the RTD Input Module/Channel Isolated RTD Input Module User's Manual.

	A68RD4N			Q64RD	
Address (decimal)	Name	Read/write	Address (decimal)	Name	Read/write
0	Conversion enable/disable specification		0	Conversion enable/disable specification	
1	Averaging processing selection		1	CH1 Time/count averaging setting	
2	CH1 Averaging time/count		2	CH2 Time/count averaging setting	R/W
3	CH2 Averaging time/count		3	CH3 Time/count averaging setting	
4	CH3 Averaging time/count		4	CH4 Time/count averaging setting	
5	CH4 Averaging time/count	R/W	5		
6	CH5 Averaging time/count		6		
7	CH6 Averaging time/count		7	System area (Not used)	-
8	CH7 Averaging time/count	-	8		
9	CH8 Averaging time/count		9	Averaging processing selection	R/W
10	CH1 Detected temperature value (16bit)		10	Conversion completion flag	
11	CH2 Detected temperature value (16bit)		11	CH1 Measured temperature value (16bit)	
12	CH3 Detected temperature value (16bit)		12	CH2 Measured temperature value (16bit)	R
13	CH4 Detected temperature value (16bit)		13	CH3 Measured temperature value (16bit)	
14	CH5 Detected temperature value (16bit)		14	CH4 Measured temperature value (16bit)	
15	CH6 Detected temperature value (16bit)		15		
16	CH7 Detected temperature value (16bit)		16		
17	CH8 Detected temperature value (16bit)		17	System area (Not used)	-
18	CH1 Detected temperature value (L)		18		
19	(32bit) (H)		19	Error code	
20	CH2 Detected temperature value (L)		20	Setting range	R
21	(32bit) (H)		21	County rungs	
22	CH3 Detected temperature value (L)	R	22		
23	(32bit) (H)		23		
24	CH4 Detected temperature value (L)		24		
25	(32bit) (H)		25		
26	CH5 Detected temperature value (L)		26		
27	(32bit) (H)		27		
28	CH6 Detected temperature value (L)		28		
29	(32bit) (H)		29		
30	CH7 Detected temperature value (L)		30		
31	(32bit) (H)		31		
32	CH8 Detected temperature value (L)		32		
33	(32bit) (H)		33		
34	Write data error code	R/W	34	System area (Not used)	-
35	Conversion completion flag	R	35		
36	Specification of platinum RTD type	R/W	36		
- 00	opeomodion of plasmam TCTD type	1000	37		
			38		
			39		
			40		
			41		
			42		
			43		
			44		
			45		
			46	NA/amainan andranda amaini - /-li la ladela	D 04/
			47	Warning output enable/disable setting	R/W

	Q64RD	
Address	Name	Read/write
(decimal) 48	Warning output flag	
49	Disconnection detection flag	
50	CH1 Scaling value	-
51	CH2 Scaling value	-
52	CH3 Scaling value	
53	CH4 Scaling value	
54	CH1 Measured temperature value (L)	1 _
55	(32bit) (H)	R
56	CH2 Measured temperature value (L)	
57	(32bit) (H)	
58	CH3 Measured temperature value (L)	
59	(32bit) (H)	
60	CH4 Measured temperature value (L)	
61	(32bit) (H)	
62	CH1 Scaling range lower limit value (L)	
63	(H)	
64	CH1 Scaling range upper limit value (L)	
65	(H)	
66	CH2 Scaling range lower limit value (L)	
67	(H)	
68	CH2 Scaling range upper limit value (L)	
69	(H)	
70	CH3 Scaling range lower limit value (L)	
71	(H)	
72	CH3 Scaling range upper limit value (L)	
73	(H)	
74 75	CH4 Scaling range lower limit value (L)	
76	(H) CH4 Scaling range upper limit value (L)	_
77	(H)	
78	CH1 Scaling width lower limit value	R/W
79	CH1 Scaling width upper limit value	-
80	CH2 Scaling width lower limit value	-
81	CH2 Scaling width upper limit value	
82	CH3 Scaling width lower limit value	
83	CH3 Scaling width upper limit value	
84	CH4 Scaling width lower limit value	
85	CH4 Scaling width upper limit value	
86	CH1 Warning output lower/lower (L)	
87	limit value (H)	
88	CH1 Warning output lower/upper (L)	
89	limit value (H)	
90	CH1 Warning output upper/lower (L)	
91	limit value (H)	
92	CH1 Warning output upper/upper (L)	
93	limit value (H)	
	to	
116	CH4 Warning output upper/upper (L)	
117	limit value (H)	
118	CH1 Offset temperature setting (L)	R/W
119	value (H)	
120	CH1 Gain temperature setting (L)	
121	value (H)	
	to	
132	CH4 Gain temperature setting (L)	R/W
133	value (H)	

Q64RD				
Address	Name	Read/write		
(decimal)				
134 to 157	Not used	-		
158	Mode switching setting			
159	wode switching setting	R/W		
160	3-conductor type	FX/VV		
100	CH1 Factory default offset value			
to				
254	254 4-conductor type CH4 User range (L)			
255	settings gain resistance value (H)	R/W		

4.8 A68RD4N (Replacement to the Q64RD-G)

4.8.1 Performance comparison

If	tem	A68RD4N	
Measuring me	ethod	4-wire type	
		16-bit signed binary	
		-1800 to 6000	
Output (tempe	erature	Value up to the first decimal place × 10	
conversion val	lue)	32-bit signed binary	
		-180000 to 600000	
		Value up to the third decimal place × 1000	
		Pt100	
		(JIS C1604-1997, IEC 751-am2, JIS C1604-1989, DIN 43760-1980)	
Applicable RT	D	JPt100	
		(JIS C1604-1981)	
	Pt100	-180 to 600°C	
Measured		(27.10 to 313.71Ω)	
temperature	JPt100	-180 to 600°C	
range		(25.80 to 317.28Ω)	
	Ni100	-	
Accuracy		±1%	
		(accuracy at full scale)	
Resolution		0.025°C	
Conversion sp	peed	40ms/channel	
Number of and	alog input points	8 channels/module	
	t for temperature	1mA	
detection			
Isolation meth	od	Between platinum RTD input and programmable controller power supply: photocoupler isolation	
		Between platinum RTD input and channel: non-isolation	
Dielectric with	stand voltage	Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute	
Diologia Williama Voltago		Bottleshi platinani (17 B inpat and programmable solutions) portor cappi). See vite, for 1 minute	
Disconnection detection		Batch-detected at all channels	
Number of occ	cupied I/O points	32 points	
		(I/O assignment: special 32 points)	
External connection system		38-point terminal block	
Applicable wire	e size	0.75 to 2mm ²	
Applicable sole	derless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	

O : Compatible, \triangle : Partial change required, \times : Incompatible

Q64RD-G	Compatibility	Precautions for replacement
3/4-wire type	0	
16-bit signed binary -2000 to 8500 Value up to the first decimal place × 10 32-bit signed binary data -200000 to 850000 Value up to the third decimal place × 1000	0	
Pt100 (JIS C 1604-1997, IEC751 1983) JPt100 (JIS C 1604-1981) Ni100 (DIN 43760 1987)	Δ	As the compliance standards for the applicable RTD differ, change the RTD to the one that can be used with the Q64RD-G.
-200 to 850°C -180 to 600°C	0	
-60 to 180°C		
*1	0	
0.025°C	0	
40ms/channel	0	
4 channels/module	Δ	Consider replacement with multiple Q64RD-G.
1mA	0	
Isolated area Isolation method Dielectric withstand voltage Insulation resistance	0	
Detected per channel	0	
16 points (I/O assignment: intelligent 16 points)	Δ	The number of occupied I/O points has changed to 16 points.
18-point terminal block	×	
0.3 to 0.75mm ² 1.25-3 R1.25-3	×	Wiring change is required.
(Sleeved solderless terminal cannot be used.)	×	

^{*1} Indicates accuracy of the Q64RD-G (accuracy at the maximum value in the selection range).

	Accuracy	Specifications	
Reference accuracy		Within 0.04%	
	Pt100/JPt100 (-20 to 120°C)	±70ppm/°C (±0.0070%/°C)	
Tomporature coefficient	Pt100/JPt100 (0 to 200°C)	±65ppm/°C (±0.0065%/°C)	
Temperature coefficient	Pt100/JPt100 (-200 to 850°C)	±50ppm/°C (±0.0050%/°C)	
	Ni100Ω (-60 to 180°C)	±70ppm/°C (±0.0070%/°C)	

Item	A68RD4N	
Cable across module - platinum resistance thermometer	Set the total resistance value of a conductor where the current runs to 70Ω or less. Example: When connecting Pt100 to CH1 and CH2 Conductor a1 A68RD4N CH.1 Pt100 2) b1/a2 SLD A2 Pt100 4) b2/a3 Lay wiring so that the following condition is met. 1) + 2) + 3) + 4) \leq 70 (Ω) - indicates the direction of current.	
Internal current consumption (5VDC)	0.41A	
Weight	0.43kg	

O : Compatible, \triangle : Partial change required, \times : Incompatible

Q64RD-G	Compatibility	Precautions for replacement
The conductor resistance value must meet the condition of 1) + 2) $\leq 2k\Omega$ or less. (In the case of 3-conductor type, the difference between 1) and 2) in the conductor resistance value must be 10Ω or less.)		
Q64RD-G a1 A1 B1 b1 SLD	0	
Q64RD-G a1 A1 B1 b1 SLD		
0.62A	Δ	The recalculation of internal current consumption (5VDC) is required.
0.20kg	0	

4.8.2 Functional comparison

O : Available, - : Not available

Item	Description	A68RD4N	Q64RD-G	Precautions for replacement
Conversion enable/disable specification of each channel	Enables/disables a detection of temperature.	0	0	
Sampling/averaging processing selection	Processes the detected temperature by specified method.	0	0	The setting ranges of time and count averages differ. Refer to the RTD Input Module/ Channel Isolated RTD Input Module User's Manual to check the specifications.
Detected temperature value storage	Stores temperature data in the buffer memory.	0	0	
Disconnection detection	Detects a disconnection of the connected RTD or cable.	0	0	For the Q64RD-G, a disconnection is detected per channel.
Type specification of RTD	Specifies a RTD type used.	0	0	
Range switching function	Switches the measured temperature range.	-	0	
Warning output function	Outputs a warning when the temperature exceeds the set temperature range.	-	0	
Scaling function	Converts a measured temperature value into a percent value (%) in set width.	-	0	
Error correction function	Corrects an error in temperature conversion value.	0	0	Perform the error correction by the offset/gain setting of the Q64RD-G.
Online module replacement	Replaces a module without stopping the system.	-	0	Replaceable modules during online are the Process CPU and the Redundant CPU.

4.8.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals and sequence program, refer to the RTD Input Module/Channel Isolated RTD Input Module User's Manual.

	A68RD4N				Q64RD-G			
Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	
X0	Watchdog timer error flag	Y0		X0	Module READY	Y0	Not used	
X1	READY flag	Y1		X1	CH1 Offset/gain setting status signal	Y1	CH1 Offset setting request	
X2	Write data error flag	Y2		X2	CH2 Offset/gain setting status signal	Y2	CH1 Gain setting request	
Х3	Σ disconnection detection flag (CH1 to CH8)	Y3		Х3	CH3 Offset/gain setting status signal	Y3	CH2 Offset setting request	
X4		Y4		X4	CH4 Offset/gain setting status signal	Y4	CH2 Gain setting request	
X5		Y5	Not used	X5		Y5	CH3 Offset setting request	
X6		Y6		X6	Not used	Y6	CH3 Gain setting request	
X7		Y7		X7	Not used	Y7	CH4 Offset setting request	
X8		Y8		X8		Y8	CH4 Gain setting request	
X9		Y9		X9	Operating condition setting completion signal	Y9	Operating condition setting request	
XA		YA		XA	Offset/gain setting mode status flag	YA	User range write request	
XB		YB		XB	Not used	YB		
XC		YC		XC	Disconnection detection signal	YC	Not used	
XD		YD	Interlock signal for the	XD	Warning output signal	YD	Not used	
XE	Not used	YE	RFRP and RTOP instructions when the	XE	Conversion completion flag	YE		
XF		YF	A68RD4N is used in remote I/O station	XF	Error flag	YF	Error clear request	
X10		Y10	Not used					
X11		Y11						
X12 X13		Y12 Y13	Error code reset flag					
X13		Y14						
X15		Y15						
X16		Y16						
X17		Y17						
X18		Y18						
X19		Y19						
X1A		Y1A	Not used					
X1B X1C		Y1B Y1C						
X1D	Interlock signal for the	Y1D						
X1E	RFRP and RTOP	Y1E						
	instructions when the	,_						
X1F	A68RD4N is used in	Y1F						
	remote I/O station							

4.8.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs. For details of the buffer memory and sequence program, refer to the RTD Input Module/Channel Isolated RTD Input Module User's Manual.

	A68RD4N			Q64RD-G	
Address	Name	Read/write	Address	Name	Read/write
(decimal)	Name	Reau/write	(decimal)	Name	Read/write
0	Conversion enable/disable specification		0	Conversion enable/disable setting	
1	Averaging processing selection		1	CH1 Time/count/moving average/time	
				constant setting	
2	CH1 Averaging time/count		2	CH2 Time/count/moving average/time constant setting	R/W
3	CH2 Averaging time/count		3	CH3 Time/count/moving average/time constant setting	
4	CH3 Averaging time/count	R/W	4	CH4 Time/count/moving average/time constant setting	
5	CH4 Averaging time/count		5		
6	CH5 Averaging time/count		40	System area	
7	CH6 Averaging time/count		to	System area	-
8	CH7 Averaging time/count		8		
9	CH8 Averaging time/count		9	Averaging processing selection	R/W
10	CH1 Detected temperature value (16bit)		10	Conversion completion flag	
11	CH2 Detected temperature value (16bit)		11	CH1 Measured temperature value (16bit)	
12	CH3 Detected temperature value (16bit)		12	CH2 Measured temperature value (16bit)	R
13	CH4 Detected temperature value (16bit)		13	CH3 Measured temperature value (16bit)	
14	CH5 Detected temperature value (16bit)		14	CH4 Measured temperature value (16bit)	
15	CH6 Detected temperature value (16bit)		15		
16	CH7 Detected temperature value (16bit)		to	System area (Not used)	
17	CH8 Detected temperature value (16bit)	7	to	System area (Not used)	-
18	CH1 Detected temperature value (L)		18		
19	(32bit) (H)		19	Error code	
20	CH2 Detected temperature value (L)		20	Setting range 1	R
21	(32bit) (H)	R	21	Setting range 2	
22	CH3 Detected temperature value (L)	T K	22		
23	(32bit) (H)		23		
24	CH4 Detected temperature value (L)		24		
25	(32bit) (H)		25		
26	CH5 Detected temperature value (L)		26		
27	(32bit) (H)		27		
28	CH6 Detected temperature value (L)		28		
29	(32bit) (H)		29		
30	CH7 Detected temperature value (L)		30	System area (Not used)	-
31	(32bit) (H)		31		
32	CH8 Detected temperature value (L)		32		
33	(32bit) (H)		33		
34	Write data error code	R/W	34		
35	Conversion completion flag	R	35		
36	Specification of platinum RTD type	R/W	36		
			37		
			38	1	1

	Q64RD-G			
Address	Name	Read/write		
(decimal)				
39				
40				
41				
42	System area (Not used)	_		
43	,			
44				
45				
46				
47	Warning output enable/disable setting	R/W		
48	Warning output flag			
49	Disconnection detection flag			
50 to 53	CH1 to CH4 Scaling value	R		
54	CH1 Measured temperature (L)			
55	value (32bit) (H)			
	to			
60	CH4 Measured temperature (L)	R		
61	value (32bit) (H)			
62	CH1 Scaling range lower limit value (L)			
63	(H)	DAM		
64	CH1 Scaling range upper limit value (L)	R/W		
65	(H)			
	to			
76	CH4 Scaling range upper limit (L)			
77	value (H)			
78	CH1 Scaling width lower limit value	R/W		
79	CH1 Scaling width upper limit value			
	to			
85	CH4 Scaling width upper limit value			
86	CH1 Warning output lower lower (L)	1		
87	limit value (H)			
88	CH1 Warning output lower upper (L)	-		
89	limit value (H)	R/W		
90	CH1 Warning output upper lower (L)	1		
91	limit value (H)			
92	CH1 Warning output upper upper (L)	-		
93	l			
93	limit value (H)			
116	CH4 Warning output upper upper (L)			
116	l			
	limit value (H)	-		
118	CH1 Offset temperature setting value (L)	R/W		
119	(H)	4		
120	CH1 Gain temperature setting value (L)			
121	(H)			
400	to	1		
132	CH4 Gain temperature setting value (L)			
133	(H)	R/W		
134	Extended averaging processing selection			
135 to 147	System area (Not used)	-		
148	Conversion setting for disconnection	R/W		
	detection	17/4/		
149	System area (Not used)	-		
150	CH1 Conversion setting value for (L)	R/W		
151	disconnection detection (H)	IVVV		
		•		

	Q64RD-G	
Address	Nome	Doodhuite
(decimal)	Name	Read/write
	to	
156	CH4 Conversion setting value for (L)	
157	disconnection detection (H)	
158	Mode awitching actting	
159	Mode switching setting	
160	3-conductor type CH1 Factory default (L)	
161	offset value (H)	
162	3-conductor type CH1 Factory default (L)	
163	gain value (H)	
164	3-conductor type CH1 User range (L)	
165	settings offset value (H)	
166	3-conductor type CH1 User range (L)	
167	settings gain value (H)	
168	3-conductor type CH1 User range (L)	
169	settings offset resistance value (H)	R/W
170	3-conductor type CH1 User range (L)	10/00
171	settings gain resistance value (H)	
172	4-conductor type CH1 Factory default (L)	
173	offset value (H)	
174	4-conductor type CH1 Factory default (L)	
175	gain value (H)	
176	4-conductor type CH1 User range (L)	
177	settings offset value (H)	
178	4-conductor type CH1 User range (L)	
179	settings gain value (H)	
180	4-conductor type CH1 User range (L)	
181	settings offset resistance value (H)	
182	4-conductor type CH1 User range (L)	
183	settings gain resistance value (H)	
	to	
254	4-conductor type CH4 User range (L)	R/W
255	settings gain resistance value (H)	17/77

5

MULTIPLEXER REPLACEMENT

The multiplexer module is designed especially for channel extension of the analog-digital converter module A616AD.

Analog input signals (voltage/current) taken by the multiplexer module are output as analog output signals (voltage) to the A616AD.

For this reason, the I/O characteristics and the maximum resolution of the multiplexer module are adjusted to be the same as the voltage input specifications of the A616AD.

Check the set range in each channel of the existing multiplexer module to estimate the I/O characteristics and the maximum resolution.

5.1 A60MX

As regarding A60MX non-isolated multiplexer module, consider replacement using multiple Q68ADV/I.

5.1.1 Performance comparison

Item		A60MX					
Analog input	Voltage	-10 to 0 to +10VDC (Input resistance value: $1M\Omega$)					
	Current	-20 to 0 to +20mADC (Input resistance value: 250Ω)					
Analog output	Analog output voltage -10 to 0 to +10VDC						
		Analog in	nput range				
		Voltage (V)	Current (mA)	Analog output voltage (V)*1			
		0 to +10	0 to +20				
	0 to + 5 + 1 to + 5 -10 to +10		0 to +20				
			+ 4 to +20	0 to +10			
			-20 to +20				
I/O characteris	tion	- 5 to + 5	-20 to +20				
i/O characteris	aucs	0 to +10	0 to +20	0 to + 5			
		0 to + 5 0 to +20		0 10 + 5	5		
		+ 1 to + 5	+ 4 to +20	+ 1 to + 5			
		-10 to +10	-20 to +20	-10 to +10			
		- 5 to + 5	-20 to +20	-10 to +10			
		-10 to +10	-20 to +20	- 5 to + 5			
		- 5 to + 5	-20 to +20	- 5 10 + 5			

 $\bigcirc: Compatible, \triangle: Partial \ change \ required, \ \times: Incompatible$

Q68ADV				Q68ADI		Compatibility	Precautions for replacement
	-10 to 10	VDC		•	•		
(Inp	ut resistance	value: 1MΩ)		-			The voltage/current cannot be
	_			0 to 20mAD	C	Δ	mixed for one module.
			(Ir	nput resistance va	lue: 250Ω)		
			-			-	Analog output voltage to the A616AD
			1.6	18.1	Constant Constant		
Anal	og input	Normal reso		High resolu			
ra	ange	Digital output value	Maximum resolution	Digital output value	Maximum resolution		When using A616AD in [-5 to
	0 to 10V	output value	2.5mV	0 to 16000	0.625mV		5V] range, Q68ADV can obtain equivalent resolution or more than A616AD by setting in [-10
	0 to 10V	0 to 4000	1.25mV	0 10 10000	0.625IIIV 0.416mV		
		0 10 4000		0 to 12000			
Voltage	1 to 5V		1.0mV		0.333mV	Δ	to 10V] range/high resolution
	-10 to 10V		2.5mV	-16000 to 16000	0.625mV		
	User range settings	-4000 to 4000	0.375mV	-12000 to 12000	0.333mV		mode or user range. When using A616AD in [-20 to +20mA] range, use Q68ADI in user range.
	0 to 20mA	0.4- 4000	5µA	0.4- 40000	1.66µA		
Current	4 to 20mA	0 to 4000	4µA	0 to 12000	1.33µA		
Current	User range settings	-4000 to 4000	1.37µA	-12000 to 12000	1.33µA		-

Item	A60MX					
Overall accuracy	±0.3% (Digital output value ±12)					
Absolute Voltage	±15V					
maximum input Current	±30mA					
Analog input points	16 channels/module					
Multiplexer element	IC relay					
Isolation method	Between the input terminal and programmable controller: photocoupler isolation Between channels: non-isolated (1M Ω resistor isolation)					
Occupied I/O points	16 points (treated as empty slots) (0 point setting is possible by I/O assignment.)					
Connected terminal	38-point terminal block					
Applicable wire size	0.75 to 2mm ² (Applicable tightening torque: 39 to 59N•cm)					
Applicable solderless terminal	V1.25-3, V1.25-YS3A, V2-YS3A					
Internal current consumption (5VDC)	0.65A					
Weight	0.55kg					

O: Compatible, △: Partial change required, ×: Incompatible

Q68ADV				Q68ADI			Compatibility	Precautions for replacement
Analog input range 0 to 10V -10 to 10V -10 to 5V 1 to 5V Users range settings	Norm Ambient te 0 to With temperature drift compensation	al resolution memperature 55°C Without temperature drift compensation ±0.4% (±16 digits)	- Ambient temperature 25±5°C	High Ambient te 0 to With temperature drift	resolution more emperature 55°C Without temperature drift compensation ±0.4% (±64 digits) ±0.4% (±48 digits)	Ambient temperature 25±5°C	Compatibility	A60MX is the accuracy in respect to the full scale, and Q68ADV/I is the accuracy in respect to maximum digital output value.
Current 20mA Users range settings	±15V			3	- ±30mA		. 0	
		8 cha	nnels/modu	s/module			Δ	Consider replacement with multiple Q68ADV/I.
Between the I/O terminal and programmable controller power supply: photocoupler isolation Between channels: non-isolated							0	
16 points (I/O assignment: intelligent 16 points)							Δ	Q68ADV/I cannot set to 0 point with I/O assignment.
		t terminal b				×	Wiring change is required.	
	ninal with sl	sleeve can not be used.)			×			
	0.64A			0.64A			0	
	0.19kg			(0.19kg		0	

Analog output (voltage) to the A616AD, processing analog input values of the A60MX.

The I/O characteristics and the maximum resolution are to be the same as in the specifications of the A616AD as below.

Input	Analog input range	Maximum resolution	Digital output value
	0 to +10	2.5mV (1/4000)	
	0 to +5	1.25mV (1/4000)	0 to 4000
Voltage (V)	+1 to +5	1.0mV (1/4000)	-2000 to 2000
	-10 to +10	5.0mV (1/4000)	-2000 to 2000
	-5 to +5	2.5mV (1/4000)	
	0 to 120	10 (1/2000)	0 to 2000
	0 to +20	10μA (1/2000)	-2000 to 0
	0 to +20	5μA (1/4000)	0 to 4000
Current (mA)	+4 to +20	4μA (1/4000)	-2000 to 2000
Current (mA)	20 to 120	20 (4/2000)	1000 to 3000
	-20 to +20	20μA (1/2000)	-1000 to 1000
	-20 to +20	10µA (1/4000)	0 to 4000
	-20 (0 +20	10μΑ (1/4000)	-2000 to 2000

5.2 A60MXRN

As regarding A60MXRN non-isolated multiplexer module, consider replacement using multiple Q64AD-GH.

5.2.1 Performance comparison

Ito	em		A60MXRN						
	Voltage	-10 to 0 to	o +10VDC (Input resistance value	e: 1MΩ)					
Analog input	Current	-20 to 0 to +20mADC (Input resistance value: 250Ω)							
Analog output	voltage	-10 to 0 to +10VDC							
		Analog inp							
		Voltage (V)	Analog output voltage (V)*1						
		0 to +10	Current (mA) 0 to +20						
		0 to + 5	0 to +20						
		+ 1 to + 5	7.17						
		-10 to +10	-20 to +20						
		- 5 to + 5	-20 to +20						
I/O characteris	tics	0 to +10	0 to +20	_					
		0 to + 5	0 to +20	0 to + 5					
		+ 1 to + 5	+ 4 to +20	+ 1 to + 5					
		-10 to +10	-20 to +20						
		- 5 to + 5	-20 to +20	-10 to +10					
		-10 to +10	-20 to +20						
		-5 to +5 -20 to +20 -5 to +5							
Absolute maximum input	Voltage t Current		±15V ±30mA						
	Guirent	ISUIIA							
Analog input po	oints	16 channels/module							
Multiplexer elei	ment	Photo MOS relay							
Isolation metho	bd	Between the input terminal and programmable controller: photocoupler isolation							
	, u	Betwee	en channels: photo MOS relay iso	plation					
Between chanr withstand volta		400VDC (accuracy guarantee 400VDC)							
Occupied I/O p	ooints		6 points (treated as empty slots)						
Connected terr		(U point	setting is possible by I/O assign 38-point terminal block	ment.)					
Applicable wire		0.75 to 0	(Applicable tightening torque: 39) to FONLow)					
			(Applicable tightening torque: 39						
Applicable solo	derless terminal	V1.2	20-3, V 1.25-Y S3A, V2-S3, V2-YS	DOA.					
Internal current (5VDC)	t consumption	0.35A							
Weight			0.56kg						

 \bigcirc : Compatible, \triangle : Partial change required, \times : Incompatible

			Compatibility	Precautions for replacement			
	-10 to 0 t	to +10VD	0				
	0 to 20	OmADC (I	nput resistar	nce value: 250Ω)		Δ	The minus current cannot be input.
			-	Analog output voltage to the A616AD			
Input Analog input range Maximum resolution Digital output value Digital output value (32 bit) (16 bit)							When using a range of -5 up to +5 (with A60MX), With Q64AD-GH,
	0 to 10V	156.3µV	312.6µV				equivalent or more resolution value
	0 to 5V	78.2µV	156.4µV				can be obtained by setting at a
	1 to 5V	62.5µV	125.0µV	0 to 64000	0 to 32000		range of -10 up to 10V/high
Voltage	User range settings (Uni-polar)	47.4μV	94.8µV			Δ	resolution mode, or user range.
	-10 to 10V User range settings	156.3µV	312.6µV 94.8µV	-64000 to 64000	-32000 to 32000		When using a range of -20 up to +20mA (with A60MX), negative
	(Bi-polar) 0 to 20mA	47.4μV 312.5nA	94.ομν 625.0nA				current can not be converted with Q64AD-GH.
0	4 to 20mA	250.0nA	_	0.4-04000	0.4- 22000		Use conversion devices to convert
Current	User range settings (Uni-polar)	151.6nA	303.2nA	0 to 64000	0 to 32000		into a input range.
	erence accuracy		Digital out	±0.05% but value (32 bit) ±32 but value (16 bit) ±16 ppm/°C (0.00714%/°	6 digits	0	A60MXRN is the accuracy in respect to the full scale, and Q64AD-GH is the accuracy in respect to maximum digital output value.
			±15V			0	
			±30mA			0	
		4 0	hannels/mod	dule		Δ	Consider replacement with multiple Q64AD-GH.
			-			-	
	Specific isolated area		Isolation	Dielectric withstar			
	ween the I/O terminal		method Photocoupler	voltage	resistance	0	
programmable controller power s Between analog channels			isolation Transformer isolation	1780VrmsAC/3 cyc (Altitude 2000m)	-		
		2!	16 points	Δ	Q64AD-GH cannot set to 0 point		
 -	(1/0		nent: intellige		with I/O assignment.		
			oint terminal 0.3 to 0.75mn	×	Wiring change is required.		
R1.25-3 (A solderless terminal with sleeve can not be used.)						×	Training officings to required.
	0.89A						The recalculation of internal current consumption [5VDC] is
			0.2kg			0	required.

*1 Analog output (voltage) to the A616AD, processing analog input values of the A60MX.

The I/O characteristics and the maximum resolution are to be the same as in the specifications of the A616AD as below.

Input	Analog input range	Maximum resolution	Digital output value	
	0 to +10	2.5mV (1/4000)		
	0 to +5	1.25mV (1/4000)	0 to 4000	
Voltage (V)	+1 to +5	1.0mV (1/4000)	-2000 to 2000	
	-10 to +10	5.0mV (1/4000)	-2000 10 2000	
	-5 to +5	2.5mV (1/4000)		

Memo		

5.3 A60MXR

As regarding A60MXR non-isolated multiplexer module, consider replacement using multiple Q64AD-GH.

5.3.1 Performance comparison

Ite	em		A60MXR					
	Voltage	-10 to 0	to +10VDC (Input resistance valu	ue: 1MΩ)				
Analog input	Cumant		-20 to 0 to +20mADC					
	Current	(Input resistance value: 250 Ω)						
Analog output voltage		-10 to 0 to +10VDC						
I/O characteristics		Analog ir						
		Voltage (V)	Current (mA)	Analog output voltage (V)*1				
		0 to +10 0 to +20						
		0 to + 5	0 to +20					
		+ 1 to + 5 + 4 to +20		0 to +10				
		-10 to +10	-20 to +20					
		- 5 to + 5	-20 to +20					
		0 to +10	0 to +20	0 to + 5				
	_	0 to + 5	0 to +20	0.0.0				
	_	+ 1 to + 5	+ 4 to +20	+ 1 to + 5				
	_	-10 to +10	-20 to +20	-10 to +10				
	_	- 5 to + 5	-20 to +20	10 10 110				
		-10 to +10	-20 to +20					
		- 5 to + 5	-20 to +20	- 5 to + 5				
Abaabaa	Notes as							
Absolute	Voltage		±15V					
maximum input	Current	±30mA 16 channels/module						
Analog input po	oints							
Multiplexer eler	ment	Mercury plunger relay						
Isolation metho	od	Between the input terminal and programmable controller: photocoupler isolation						
		Betweer	n channels: mercury plunger relay	isolation				
Between chanr dielectric withst		500VDC (accuracy guarantee 500VDC)						
Occupied I/O p	oints		16 points (treated as empty slots	•				
Connected terr	ninal	(U poir	nt setting is possible by I/O assign 38-point terminal block	iment.)				
Applicable wire		0.75 to 0	1 ² (Applicable tightening torque: 3	O to FONLow)				
			1- (Applicable tightening torque: 3 .25-3, V1.25-YS3A, V2-S3, V2-YS					
Applicable sold	eness terminal	V1	.20-0, V 1.20-1 00A, V2-00, V2-Y8	OUA .				
Internal current (5VDC)	consumption	0.5A						
Weight			0.6kg					

O : Compatible, △ : Partial change required, ×: Incompatible

			Compatibility	Precautions for replacement			
	-10 to 0 t	:o +10VDC	0				
	0 to 20	OmADC (Ir	Δ	The minus current cannot be input.			
			-	Analog output voltage to the A616AD			
		Maximun	n resolution	Digital	Digital		With A60MXR, equivalent or more
Input	Analog input range	32 bits	16 bits	output value (32 bits)	output value (16 bits)		resolution value can be obtained by setting at the analog inputs,
	0 to 10V	156.3µV	312.6µV				range of -10 up to 10V/high
	0 to 5V	78.2µV	156.4µV				resolution mode, and User range
	1 to 5V	62.5µV	125.0µV	0 to 64000	0 to 32000		while the analog inputs are used at
Voltage	User range settings (Uni-polar)	47.4µV	94.8µV			Δ	the range of -5 up to 5V on Q64AD-GH.
	-10 to 10V	156.3µV	312.6µV				When using a range of -20 up to
	User range settings (Bi-polar)	47.4µV	94.8µV	-64000 to 64000	-32000 to 32000		+20mA (with A60MXR), negative
	0 to 20mA	312.5nA	625.0nA				current can not be converted with
Current	4 to 20mA	250.0nA	500.0nA	0 to 64000	0 to 32000		Q64AD-GH.
User range settings (Uni-polar)		e settings 151 6nA 303 2nA		0 10 64000	0 10 32000		Use conversion devices to convert into a input range.
Reference accuracy Temperature coefficient			±0.05% Digital output value (32 bit) ±32 digits Digital output value (16 bit) ±16 digits ±71.4ppm/°C (0.00714%/°C)			0	to the full scale, and Q64AD-GH is the accuracy in respect to maximum digital output value.
			±15V ±30mA			0	
		4 cl	nannels/mod	lule		Δ	Consider replacement with multiple Q64AD-GH.
			-			-	
	Specific isolated area		Isolation method	Dielectric withstan	d Insulation resistance		
	ween the I/O terminal mable controller power		Photocoupler isolation	1780VrmsAC/3 cyc	les 500VDC,	0	
В	etween analog channe	els	Transformer isolation	(Altitude 2000m)	10M Ω or more		
	(1/0	O assignm	Δ	Q64AD-GH cannot set to 0 point with I/O assignment.			
		18-pc	×				
0.3 to 0.75mm ² R1.25-3 (A solderless terminal with sleeve can not be used.)						×	Wiring change is required.
	K1.∠5-3 (A S0	iueriess te	inilinai With S	sieeve can not de l	15 C U.)	×	The recoloulation of interest
			0.89A			Δ	The recalculation of internal current consumption [5VDC] is required.
 			0.2kg			0	

*1 Analog output (voltage) to the A616AD, processing analog input values of the A60MX.

The I/O characteristics and the maximum resolution are to be the same as in the specifications of the A616AD as below.

Input	Analog input range	Maximum resolution	Digital output value	
	0 to +10 2.5mV (1/4000)			
	0 to +5	1.25mV (1/4000)	0.45.4000	
Voltage (V)	+1 to +5	1.0mV (1/4000)	0 to 4000	
	-10 to +10	5.0mV (1/4000)	-2000 to 2000	
	-5 to +5	2.5mV (1/4000)		

6 HIGH-SPEED COUNTER MODULE REPLACEMENT

6.1 List of High-Speed Counter Module Alternative Models for Replacement

Production disco	ntinuation		Transition to Q series
Product	Model	Model	Remarks (Restrictions)
High-speed counter	AD61	QD62-H01 ^{*1}	1) External wiring : Terminal block wiring → Connector wiring Cable size is changed. 2) Number of slots : Not changed 3) Counting speed : Not changed 4) Counting range : 24-bit unsigned binary (0 to 16777215) → 32-bit signed binary (−2147483648 to 2147483647) Review the program. 5) Program : Occupied I/O points, I/O signals and buffer memory address are changed. 6) Performance specifications change: Not changed 7) Function specifications: Not changed
module	AD61S1	QD62-H02 ^{*1}	1) External wiring : Terminal block wiring → Connector wiring Cable size is changed. 2) Number of slots : Not changed 3) Counting speed : Not changed 4) Counting range : 24-bit unsigned binary (0 to 16777215) → 32-bit signed binary (−2147483648 to 2147483647) Review the program. 5) Program : Occupied I/O points, I/O signals and buffer memory address are changed. 6) Performance specifications change: Not changed 7) Function specifications: Not changed

The QD62-H01 is a module dedicated for replacing the AD61 with the Q series module. The QD62-H02 is a module dedicated for replacing the AD61S1 with the Q series module. Both of them have same input filter system with the AD61 and AD61S1.

⊠Point -

1) Action to the replaced module

Input filter system of the AD61 and AD61S1 is the same as that of the QD62-H01 and QD62-H02. Therefore, utilizing pulse generator such as existing encoder is possible.

2) Counting range of the counter

Counting range of the AD61 and AD61S1 differs from that of the QD62-H01 and QD62-H02. To make the counting range same as that of the module before replacement, review the program. AD61, AD61S1: 0 to 16, 777, 215 (24-bit unsigned binary) QD62-H01, QD62-H02: - 2,147, 483, 648 to 2, 147, 483, 647 (32-bit signed binary)

3) Wiring to the module

External wiring method of the AD61 and AD61S1 differs from that of the QD62-H01 and QD62-H02.

AD61, AD61S1: Wiring using a terminal block QD62-H01, QD62-H02: Wiring using a connector

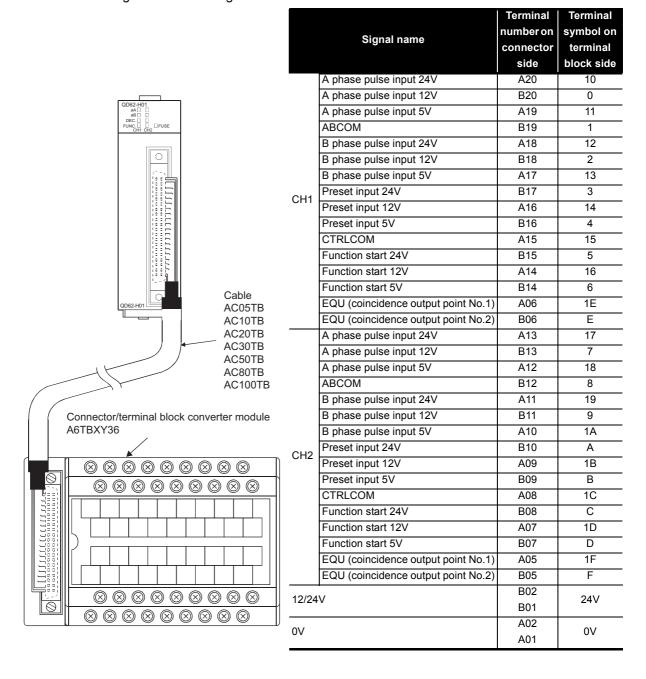
- 4) In module replacement, continuous use of the I/O signal wire with solderless terminal that has been used for the AD61 or AD61S1 requires the change of the external wiring method as in (a) (b).
 - (a) Using the upgrade tool (a conversion adaptor) The existing wiring for AD61 and AD61S1 can be connected directly to the Q series modules using the upgrade tool, a conversion adaptor, manufactured by Mitsubishi Electric Engineering Co., Ltd.

Product	MELSEC-A/QnA series module	MELSEC-Q series module	Conversion adaptor
High-speed counter module	AD61	QD62-H01	ERNT-AQTD61
riigii-speed counter module	AD61S1	QD62-H02	ERMI-AQTD01

(b) For contact information for inquiries on the upgrade tool manufactured by Mitsubishi Electric Engineering Co., Ltd., refer to Section 2.1.

(c) Using the connector/terminal block converter module Used for replacement when the Q series large type base unit and conversion adapters manufactured by Mitsubishi Electric Engineering Co., Ltd. cannot be used due to the restrictions such as a system configuration and an installation location.

I/O cables with solderless terminal of the existing module can be continuously used without being aware of the existing wire size by rewiring the I/O cables with solderless terminal to the connector/terminal block converter module and connecting them by dedicated cables. This method, therefore, is helpful when there is not a sufficient space. The following figure shows the wiring method for using the connector/terminal block converter module.



6.2 AD61

6.2.1 Performance comparison

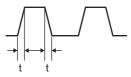
 \bigcirc : Compatible, \triangle : Partial change required, \times : Incompatible

ltem			AD	61	QD62	-H01	Compat- ibility	Precautions for replacement
Occupied I/O points			32 points (I/O assignment: special 32 points) (I/O assignment)		16 pc (I/O assignmen poin	: intelligent 16	Δ	*1
Nui	mber of chann	els		2 cha	nnels		0	
Coi	unting speed s	switch settings	-		50KF	PPS	0	Set "2" at the intelligent function module switch setting.
		Phase			2-phase input		0	
	Count input signal	Signal level (φA, φB)		5VDC 12VDC 24VDC	}2 to 5mA		0	
		Counting	1-phase input 2-phase input	50KPPS 50KPPS	1-phase input 2-phase input	50KPPS 50KPPS	0	*2
		Speed (Max.) Counting range	24-bit unsig (0 to 16,7	ned binary	32-bit sign (-2147483648 to	ed binary	Δ	On QD62-H01, as the value is used with 32-bit signed binary values, change of sequence program is required.
		Туре	UP/DOW	/N preset counte	er + ring counter t	0		
Performance specifications of 1 channels	Counter	Minimum count pulse width (set input rise time to 5µs or less. Duty ratio: 50%)		20μ 10μs (1,2 phase	10µs		0	
ance sp	Magnitude comparison	Comparison range	24-bit unsig	ned binary	32-bit sign	ed binary	0	
Perform	between CPU and AD61/QD62 -H01	Comparison result	Set value < count value Set value = count value Set value > count value				0	
		Preset	12/24VDC 5VDC,		5/12/24VDC	, 2 to 5mA		On QD62-H01, as the external
	External input	Count disable	12/24VD0 5VDC,	-	-		Δ	input specifications differ, confirm the external devices
		Function start	-		5/12/24VDC	, 2 to 5mA		specifications.
	External output	Coincidence output	(open collec	Transistor (open collector) output 12/24VDC, 0.5A		Transistor (sink type) output 2 points/channel 12/24VDC, 0.5A/point, 2A/common		
	Internal current consumption (5VDC)		0.3	BA .	0.3	A	0	
We	ight		0.5	kg	0.11	kg	0	

- *1 I/O numbers of the modules mounted to the right of the QD62-H01 change, because the number of I/O occupied points for the AD61 are different from the QD62-H01. Set the start I/O number for the module mounted to the right of the QD62-H01 to the same number for the module before the replacement in the I/O assignment tab of the Q parameter setting window. The program for the module before the replacement can be used.
- *2 The rise/fall time of a pulse affects the counting speed. Countable counting speeds are as follows. Counting a pulse greater than t = 50µs may result in a miscount.
 - For the AD61 and QD62-H01 (common for 1-phase input and 2-phase input)

Rise/fall time	Common to 1-phase input and 2-phase input
t = 5µs	50KPPS
t = 50µs	5KPPS

 $t=5\mu s: 50KPPS$ $t=50\mu s: 5KPPS$



6.2.2 Function comparison

O: With functions, -: Without functions

Item	Description	AD61	QD62-H01	Precautions for replacement
Preset function	Changes the counter present value to a specified value.	0	0	
Disable function	Terminates counting.	0	0	
Ring counter function	Repeatedly executes counting between user's setting values.	0	0	On QD62-H01, the setting is carried out using intelligent function module switch setting.
Linear counter function	If the count exceeds the range, this function detects an overflow.	-	0	
Coincidence output function	Outputs signals when user's setting and the present values are matched.	0	0	No.1 and No.2 coincidence output points can be set for each channel.
Coincidence detection interrupt function	Generates an interrupt signal to the programmable controller CPU when coincidence is detected.	-	0	
Latch counter function	Latches the present value at the time a signal is input.	-	0	
Sampling counter function	Counts the pulse that was input during the sampling time set.	-	0	
Periodic pulse counter function	The function allows storing the present value in the periodic pulse count present value and the previous value in the periodic pulse count previous value for each period time set.	-	0	

6.2.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals or sequence program, refer to the High-Speed Counter Module User's Manual.

	AD		QD62-H01					
Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	
X0	CH1 Counter value greater	Y0		X0	Module READY	Y0	CH1 Coincidence signal No.1 reset command	
X1	CH1 Counter value coincidence	Y1		X1	CH1 Counter value large (Point No.1)	Y1	CH1 Preset command	
X2	CH1 Counter value less	Y2		X2	CH1 Counter value coincidence (Point No.1)	Y2	CH1 Coincidence signal enable command	
Х3	CH1 External preset request detection	Y3		Х3	CH1 Counter value small (Point No.1)	Y3	CH1 Down count command	
X4	CH2 Counter value greater	Y4		X4	CH1 External preset request detection	Y4	CH1 Count enable command	
X5	CH2 Counter value coincidence	Y5		X5	CH1 Counter value large (Point No.2)	Y5	CH1 External preset detection reset command	
X6	CH2 Counter value less	Y6		X6	CH1 Counter value coincidence (Point No.2)	Y6	CH1 Counter function selection start command	
X7	CH2 External preset request detection	Y7	Natural	X7	CH1 Counter value small (Point No.2)	Y7	CH1 Coincidence signal No.2 reset command	
X8		Y8	Not used	X8	CH2 Counter value large (Point No.1)	Y8	CH2 Coincidence signal No.1 reset command	
X9		Y9		X9	CH2 Counter value coincidence (Point No.1)	Y9	CH2 Preset command	
XA		YA		XA	CH2 Counter value small (Point No.1)	YA	CH2 Coincidence signal enable command	
ХВ		YB		ХВ	CH2 External preset request detection	YB	CH2 Down count command	
XC		YC		XC	CH2 Counter value large (Point No.2)	YC	CH2 Count enable command	
XD		YD		XD	CH2 Counter value coincidence (Point No.2)	YD	CH2 External preset detection reset command	
XE		YE		XE	CH2 Counter value small (Point No.2)	YE	CH2 Counter function selection start command	
XF		YF		XF	Fuse broken detection flag	YF	CH2 Coincidence signal No.2 reset command	
X10		Y10	CH1 Coincidence signal reset command					
X11		Y11	CH1 Preset command					
X12	Not used	Y12	CH1 Coincidence signal output enable command					
X13		Y13	CH1 Down count command					
X14		Y14	CH1 Count enable					
X15		Y15	CH1 Present value read request					
X16		Y16	CH1 External preset detection reset command					
X17		Y17	CH2 Coincidence signal reset command					
X18		Y18	CH2 Preset command					
X19		Y19	CH2 Coincidence signal output enable command					
X1A		Y1A	CH2 Down count command					
X1B	1	Y1B	CH2 Count enable					
X1C		Y1C	CH2 Present value read request					
X1D		Y1D	CH2 External preset detection reset command					
X1E X1F		Y1E Y1F	Not used					

6.2.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs.

For details of the buffer memory or sequence program, refer to the High-Speed Counter Module User's Manual.

		AD61		QD62-H01					
Add	ress			Add	ress				
(De	ec.)	Name	Read/write	(D	ec.)	Name		Read/write	
CH1	CH2			CH1	CH2				
1	33	Preset value write (Lower and middle)	W	0	32	Preset value setting	(L)	R/W	
(2)	(34)	Preset value write (Upper)	VV	1	33	Freset value setting	(H)	IX/VV	
3	35	Mode register	R/W	2	34	Present value	(L)	R	
4	36	Present value read (Lower and middle)	R	3	35	Tesent value	(H)		
(5)	(37)	Present value read (Upper)	11	4	36	Coincidence output point set No.1	(L)		
6	38	Set value read/write (Lower and middle)	R/W	5	37	Controlactice output point set ivo.	(H)	R/W	
(7)	` '	Set value read/write (Upper)		6	38	Coincidence output point set No.2	(L)	1000	
Addre	ss in pa	arentheses in the above table indicates the	upper 8 bits	7	39		(H)		
of 24-l	bit data	l.		8	40	Overflow detection flag		R	
				9 41 Counter function selection setting			R/W		
					10 42 Sampling/periodic setting			1077	
				11	43	Sampling/periodic counter flag			
				12	44	Latch count value	(L)		
				13	45	2410.1. 004.11, 141.40	(H)		
				14	46	Sampling count value	(L)		
				15	47	campung countries	(H)	R	
				16	48	Periodic pulse count previous value	(L)		
				17	49		(H)		
				18	50	Periodic pulse count present value	(L)		
				19	51		(H)		
				20	52	Ring counter minimum value	(L)		
				21	53	3	(H) (L)	R/W	
				22 54 Ring		Ring counter maximum value		1	
				23	55		(H)		
				24	56				
				to	to	System area (Not used)	-	-	
				31	63	1			

6.3 AD61S1

6.3.1 Performance comparison

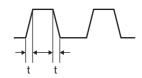
O: Compatible, \triangle : Partial change required, \times : Incompatible

Item		1	AD6	1S1	QD62	-H02	Compat- ibility	Precautions for replacement
Oce	cupied I/O poir	nts	32 points 16 points (I/O assignment: special 32 points) (I/O assignment: intelligent 16 points)				Δ	*1
Nui	mber of chann	els		2 cha	0			
	unting speed s tings	witch	-		10KF	PPS	0	Set "2" at the intelligent function module switch setting.
		Phase		1-phase input	t, 2-phase input		0	
	Count input signal	Signal level (φA, φB)		5VDC 12VDC 24VDC	2 to 5mA		0	
		Counting	1-phase input	10KPPS	1-phase input	10KPPS		
		speed (Max.)	2-phase input	7KPPS	2-phase input	7KPPS	0	*2
		Counting range	24-bit unsig (0 to 16,7	-	32-bit sign (-2147483648 to	-	Δ	On QD62-H02, as the value is used with 32-bit signed binary values, change of sequence program is required.
(0	Counter	Туре	UP/DOW	/N preset count	ter + ring counter	0		
Performance specifications of 1 channels		Minimum count pulse width (set input rise time to 5µs or less. Duty ratio: 50%)	1.7	100 µs 50 µs phase input)	142 µs 71 µs 71 µs (2-phase input)		0	
mance	Magnitude comparison	Comparison range	24-bit unsig	ned binary	32-bit sign	32-bit signed binary		
Perfori	between CPU and AD61/QD62 -H02	Comparison result		Set value =	count value count value count value		0	
		Preset	12/24VD0 5VDC,	•	5/12/24VD0	C, 2 to 5mA		On QD62-H02, as the external
	External input	Count disable	12/24VD0 5VDC,	,	-		Δ	input specifications differ, confirm the external devices
		Function start	-		5/12/24VDC	C, 2 to 5mA		specifications.
	External output	Coincidence output	Transistor (op outp 12/24VD	out	Transistor (sink points/c 12/24VDC, 2A/coi	hannel 0.5A/point,	0	
	ernal current co	onsumption	0.3	BA	0.3	BA	0	
We	ight		0.5	kg	0.11	lkg	0	



- *1 I/O numbers of the modules mounted to the right of the QD62-H02 change, because the number of I/O occupied points for the AD61S1 are different from the QD62-H02. Set the start I/O number for the module mounted to the right of the QD62-H02 to the same number for the module before the replacement in the I/O assignment tab of the Q parameter setting window. The program for the module before the replacement can be used.
- *2 The rise/fall time of a pulse affects the counting speed. Countable counting speeds are as follows. Counting a pulse whose rise/fall time is long may result in a miscount.
 - For the AD61S1 and QD62-H02

Rise/fall time	1-phase input	2-phase input
t = 5µs	10KPPS	7KPPS
t = 500µs	500PPS	250PPS



6.3.2 Function comparison

O: With functions, -: Without functions

Item	Description	AD61S1	QD62-H02	Precautions for replacement
Preset function	Changes the counter present value to a specified value.	0	0	
Disable function	Terminates counting.	0	0	
Ring counter function	Repeatedly executes counting between user's setting values.	0	0	On QD62-H02, the setting is carried out using intelligent function module switch setting.
Linear counter function	If the count exceeds the range, this function detects an overflow.	-	0	
Coincidence output function	Outputs signals when user and the present values are matched.	0	0	No.1 and No.2 coincidence output points can be set for each channel.
Coincidence detection interrupt function	Generates an interrupt signal to the programmable controller CPU when coincidence is detected.	-	0	
Latch counter function	Latches the present value at the time a signal is input.	1	0	
Sampling counter function	Counts the pulses that are input during the sampling time set.	1	0	
Periodic pulse counter function	The function allows storing the present value in the periodic pulse count present value and the previous value in the periodic pulse count previous value for each period time set.	-	0	



6.3.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals or sequence program, refer to the High-Speed Counter Module User's Manual.

	Manual.			1			
B	AD6			B	QD62	2-H02	
Device No.	Signal name	Device No.	Signal name	Device No.	Signal name	Device No.	Signal name
X0	CH1 Counter value greater	Y0		X0	Module READY	Y0	CH1 Coincidence signal No.1 reset command
X1	CH1 Counter value coincidence	Y1		X1	CH1 Counter value large (Point No.1)	Y1	CH1 Preset command
X2	CH1 Counter value less	Y2		X2	CH1 Counter value coincidence (Point No.1)	Y2	CH1 Coincidence signal enable command
Х3	CH1 External preset request detection	Y3		Х3	CH1 Counter value small (Point No.1)	Y3	CH1 Down count command
X4	CH2 Counter value greater	Y4		X4	CH1 External preset request detection	Y4	CH1 Count enable command
X5	CH2 Counter value coincidence	Y5		X5	CH1 Counter value large (Point No.2)	Y5	CH1 External preset detection reset command
X6	CH2 Counter value less	Y6		X6	CH1 Counter value coincidence (Point No.2)	Y6	CH1 Counter function selection start command
X7	CH2 External preset request detection	Y7	Netword	X7	CH1 Counter value small (Point No.2)	Y7	CH1 Coincidence signal No.2 reset command
X8		Y8	Not used	X8	CH2 Counter value large (Point No.1)	Y8	CH2 Coincidence signal No.1 reset command
X9		Y9		X9	CH2 Counter value coincidence (Point No.1)	Y9	CH2 Preset command
XA		YA		XA	CH2 Counter value small (Point No.1)	YA	CH2 Coincidence signal enable command
ХВ		YB		ХВ	CH2 External preset request detection	YB	CH2 Down count command
XC		YC		XC	CH2 Counter value large (Point No.2)	YC	CH2 Count enable command
XD		YD		XD	CH2 Counter value coincidence (Point No.2)	YD	CH2 External preset detection reset command
XE		YE		XE	CH2 Counter value small (Point No.2)	YE	CH2 Counter function selection start command
XF		YF		XF	Fuse broken detection flag	YF	CH2 Coincidence signal No.2 reset command
X10		Y10	CH1 Coincidence signal reset command				
X11		Y11	CH1 Preset command	1			
X12	Not used	Y12	CH1 Coincidence signal output enable command				
X13		Y13	CH1 Down count command	1			
X14		Y14	CH1 Count enable	l			
X15		Y15	CH1 Present value read request				
X16		Y16	CH1 External preset detection reset command				
X17		Y17	CH2 Coincidence signal reset command				
X18		Y18	CH2 Preset command	1			
X19		Y19	CH2 Coincidence signal output enable command				
X1A		Y1A	CH2 Down count command	1			
X1B		Y1B	CH2 Count enable	1			
X1C		Y1C	CH2 Present value read request				
X1D		Y1D	CH2 External preset				
			detection reset command				
X1E X1F		Y1E Y1F	Not used				
ΛΠ	1	1 11					

6.3.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs. For details of the buffer memory or sequence program, refer to the High-Speed Counter Module User's Manual.

		AD61S1		QD62-H02					
Add	ress			Add	ress				
(D	ec.)	Name	Read/write	(De	ec.)	Name		Read/write	
CH1	CH2			CH1	CH2				
1	33	Preset value write (Lower and middle)	w	0	32	Preset value setting	(L)	R/W	
(2)	(34)	Preset value write (Upper)	VV	1	33	Treset value setting	(H)	IVVV	
3	35	Mode register	R/W	2	34	Present value	(L)	R	
4	36	Present value read (Lower and middle)	R	3	35	Tresent value	(H)		
(5)	(37)	Present value read (Upper)	11	4	36	Coincidence output point set No.1	(L)		
6	38	Set value read/write (Lower and middle)	R/W	5	37	Combidence output point set ivo.	(H)	R/W	
(7)	(39)	Set value read/write (Upper)	17/77	6	38	Coincidence output point set No.2	(L)		
Addre	ss in pa	arentheses in the above table indicates the	upper 8 bits	7	39	Combidence output point set 140.2	(H)		
of 24-l	bit data	l.		8	40	Overflow detection flag		R	
				9	41	Counter function selection setting		R/W	
				10	42	Sampling/periodic setting		1000	
				11	43	Sampling/periodic counter flag			
				12	44	Latch count value	(L)		
				13	45	Eaton count value	(H)		
				14	46	Sampling count value	(L)		
				15	47	Camping Count Value	(H)	R	
				16	48	Periodic pulse count previous	(L)		
				17	49	value	(H)		
				18	50	Periodic pulse count present value	(L)		
				19	51	T chould paloe doubt present value	(H)		
				20	52	Ring counter minimum value	(L)		
				21	53	Traing counter minimum value	(H)	R/W	
			22 54 Ring counter maximum value		Ring counter maximum value	(L)]		
				23	55	Tang counter maximum value	(H)		
					56				
				to	to	System area (Not used)		-	
				31	63				

POSITIONING MODULE REPLACEMENT

7.1 List of Positioning Module Alternative Models for Replacement

	uction		Transition to Q series
Product	Model	Model	Remarks (Restrictions)
	AD70	QD73A1	Not changed *2 (An external power supply (±15VDC) is not required. 2) Number of slots : Changed (1 slot → 2 slots) 3) Program : Buffer memory assignment and change of the setting method 4) Performance specifications change: Upward-compatibility 5) Function specifications: Partly changed (LED indication and function setting method)
	AD71(S1/S2/ S7)	None	Replacing QD75 system is recommended. When replacing the existing AD71 (S1/S2/S7) with "QD75P/QD75D", refer to Technical Bulletin "FA-A-0060: Procedures for Replacing Positioning Module AD71 with QD75".
	AD70D	None	Mount AD70D to the QA6DB-type extension base unit. Otherwise, replacing with the QD75M system is recommended.
	AD72	None	Replacing with two QD73A1 modules or QD75 system is recommended.
Positioning	AD75M1	QD75M1	Connector and manual pulsar wiring are changed. Number of slots : Not changed I/O signals, XY assignment, buffer memory assignment and different functions are changed. Performance specifications change: Upward-compatibility Function specifications: Partly changed
Positioning module	AD75M2	QD75M2	Connector and manual pulsar wiring are changed. Number of slots
	AD75M3	QD75M4	External wiring : Connector and manual pulsar wiring are changed. Number of slots : Not changed : Not changed : I/O signals, XY assignment, buffer memory assignment and different functions are changed. Performance specifications change: Upward-compatibility Function specifications: Partly changed
	AD75P1-S3	QD75P1N*1 (when an open collector is connected) QD75D1N*1 (when a differential driver is connected)	External wiring : Connector and manual pulsar wiring are changed. Number of slots : Not changed : Not changed : I/O signals, XY assignment, buffer memory assignment and different functions are changed. 4) Performance specifications change: Not changed. 5) Function specifications: Partly changed
	AD75P2-S3	QD75P2N*1 (when an open collector is connected) QD75D2N*1 (when a differential driver is connected)	External wiring: Connector and manual pulsar wiring are changed. Number of slots: Not changed I/O signals, XY assignment, buffer memory assignment and different functions are changed. Performance specifications change: Not changed. Function specifications: Partly changed.

	uction inuation		Transition to Q series
Positioning module		QD75D4N (when a	Connector and manual pulsar wiring are changed. Number of slots
		differential driver is connected)	4) Performance specifications change: Not changed.5) Function specifications: Partly changed

^{*1} The QD75P\(\sigma\) and QD75D\(\sigma\) are the upward-compatibility for the QD75P\(\sigma\) and QD75D\(\sigma\) and their programs are the same when they are replaced.

- Change the sequence program as necessary with checking the processing timing, because performances such as the starting time and data update cycle are improved.
- *2 When the AD70 being used in the setting that the negative voltage is output when the positioning address increases is replaced with the QD73A1, the wiring change between the AD70 and an encoder is required. For details, refer to Section 7.6.6.

7.2 AD70D

No Q series alternative model is available. Consider mounting the existing module on the QA6□B extension base unit or shifting to the QD75M system.

7.3 AD72

No Q series alternative model is available.

Consider mounting the existing module on the QA6 B extension base unit, replacing with two QD73A1 modules, or shifting to the QD75 system.

Note that with two QD73A1 modules after the replacement, the interpolation function cannot be performed.

7.4 AD75P1-S3/P2-S3/P3-S3

7.4.1 Performance comparison

O: Compatible, △: Partial change required, ×: Incompatible

Item	Model		AD75P2-S3	AD75P3-S3	QD75P1N QD75D1N	QD75P2N QD75D2N	QD75P4N QD75D4N	Compat- ibility	Precautions for replacement
No. of contro	No. of control axes		2	3	1	2	4	0	
No. of positio	ning data		600/axis ^{*1}			600/axis		0	
Position control interpolation	2-axis linear interpolation	×	0	0	×	0	(3-/4-axis linear interpolation : available)	0	
functions	2-axis circular interpolation	×	0	0	×	0	0		
	Position control		0			0			
Positioning	Speed control		0		0				
system	Speed- position switching control		0		0			0	

O : Compatible, \triangle : Partial change required, \star : Incompatible

				O. Comp	alibie, △ . Parti	ai change re	quired, ×: incompatible
Model	AD75P1-S3 AD75P2-S3 A	AD75P3-S3	QD75P1N QD75D1N	QD75P2N QD75D2N	QD75P4N QD75D4N	Compat- ibility	Precautions for replacement
			<absolute sys<="" td=""><td>stem> to 214748364.7</td><td>7 (µm)</td><td></td><td></td></absolute>	stem> to 214748364.7	7 (µm)		
	<absolute system=""> -214748364.8 to 214748364</absolute>	1.7 (μm)	-21474.83648	3 to 21474.83	647 (inch)		
	/-13421772.8 to 13421772.7 -21474.83648 to 21474.8364	`` '	0 to 359.9999	99 (degree)			
	/-1342.17728 to 1342.17727 0 to 359.99999 (degree)	(inch)	-2147483648	to 21474836	47 (pulse)		
	/0 to 359.99999 (degree) -2147483648 to 214748364 /-134217728 to 134217727 (`` '	<incremental -214748364.8<="" td=""><td>system> to 214748364.7</td><td>⁷ (µm)</td><td></td><td></td></incremental>	system> to 214748364.7	⁷ (µm)		
	<pre><incremental system=""> -214748364.8 to 214748364</incremental></pre>	`` '	-21474.83648	3 to 21474.83	647 (inch)		
. *2	/-13421772.8 to 13421772.7 -21474.83648 to 21474.8364	-21474.83648	3 to 21474.83	647 (degree)			
Positioning range*2	-21474.83648 to 21474.83647 (degree) /-1342.17728 to 1342.17727 (degree) -2147483648 to 2147483647 (pulse) /-134217728 to 134217727 (pulse) <in control="" speed-position="" switching=""></in>		-2147483648	to 21474836	0		
			<in control<br="" speed-position="" switching="">(INC mode)/position-speed switching</in>				
			control> 0 to 21474836	4.7 (µm)			
	/0 to 13421772.7 (µm) 0 to 21474.83647 (inch)	0 to 21474.83	3647 (inch)				
	/0 to 1342.17727 (inch) 0 to 21474.83647 (degree)	0 to 21474.83	3647 (degree)				
	0 to 2147483647 (pulse) /0 to 134217727 (pulse)		0 to 2147483647 (pulse) <in (abs="" control="" mode)="" speed-position="" switching=""></in>				
			0 to 359.9999	99 (degree)			
	0.01 to 6000000.00 (mm/mir	n)	0.01 to 20000	0000.00 (mm/	min)		
	/0.01 to 375000.00 (mm/min	1)					
	0.001 to 600000.000 (inch/m	nin)	0.001 to 2000	000.000 (incl	n/min)		
. *0	/0.001 to 37500.000 (inch/m	iin)		•			
Speed command range *2	0.001 to 600000.000 (degree	*	0.001 to 2000	000.000 (deg	gree/min)	0	
	/0.001 to 37500.000 (degree	e/min)					
	1 to 1000000 (pulse/s)		1 to 1000000	(pulse/s)			
	/1 to 62500 (pulse/s)						
Machine OPR function (OPR method)	○(6 OPR methods	s)	0(6	OPR metho	ds)	0	
JOG operation	0			0		0	

O : Compatible, \triangle : Partial change required, \star : Incompatible

	Model		QD75P1N	QD75P2N	QD75P4N	Compat-	Precautions for
Item		AD75P1-S3 AD75P2-S3 AD75P3-	QD75D1N	QD75D2N	QD75D4N	ibility	replacement
Manual pulse generator function		1 generator/axis	1 9	generator/mod	ule	Δ	On QD75P□N/QD75D□N, the manual pulse generator cannot be used by each axis independent. When connecting the manual pulse generator for each axis is required, use one axis module. The manual pulse generator itself can use the same one. The operation for inputting one pulse differs. Set the parameter so that movement amount may be same.
Starting time		20ms	· ·	1.5 to 2.0ms (when other axes are starting: 1.5 to 2.0ms + 0.1ms to 0.5ms)		0	The starting time becomes fast. Check the processing timing.
	Automatic trapezoidal acceleration/ deceleration	0		0		0	
processing	S-pattern acceleration/ deceleration	0		0			
Acceleration /deceleration time	No. of patterns Setting range	Acceleration time and deceleration tin can be set independently. (4 patterns each) Changeover between 1 to 65535ms to 8388608ms possible	can b	time and dece e set independ patterns eac to 8388608m	dently. h)	0	
	Sudden stop deceleration	Changeover between 1 to 65535ms to 8388608ms possible	/1	1 to 8388608m	ıs	0	
Compensatio	on	Electronic gears, backlash compensation, near pass*3		onic gears, ba ensation, near		Δ	Refer to *3.
Error display		17-segment LED		Error LED		×	For details of diagnostic, use GX Developer.
History data s error, warning	storage (Start, g)	Provided (4 types, 16 items/module	(3 typ	Provided es, 16 items/m	nodule)	0	The start history during error is integrated into the start history.
Data storage	destination	Flash ROM (battery-less backup)	(ba	Flash ROM ttery-less back	kup)	0	

O : Compatible, \triangle : Partial change required, \star : Incompatible

		i 	O. Com	patible, \triangle . Faiti	iai change re	equired, ×: Incompatible
Model	AD75P1-S3 AD75P2-S3 AD75P3-S3	QD75P1N QD75D1N	QD75P2N QD75D2N	QD75P4N QD75D4N	Compat- ibility	Precautions for replacement
item	10136-3000VE (Soldering type, supplied)	A6CON1 (Soldering type, straight-out type, sold separately) A6CON2			-	A. (I.
Connection connector	10136-6000EL (Crimping type, sold separately)	(Soldering t	y type, straigh cold separatel A6CON4 ype, straight-ope, sold sepa	y) out/diagonal-	× -	As the connectors differ, wiring change is required. The connectors of QD75P□N/
Applicable wire size	10136-3000VE: 24 to 30 AWG (approx. 0.05 to 0.2 mm ²) 10136-6000EL:		I1, A6CON4: 6CON2: 24 AV		0	QD75D⊡N are sold separately.
Command pulse output system	28 AWG (approx. 0.08 mm ²) Differential driver/Open collector	QD75P□N: Open collector QD75D□N: Differential driver		Δ	The differential driver and the open collector are separate module. In initial condition, AD75P□-S3 outputs with positive logic, and QD75P□N/QD75D□N outputs with negative logic.	
Max. output pulse	When connected to open collector: 200kpps When connected to differential driver: 400kpps	When connected to open collector: 200kpps When connected to differential driver: 4Mpps		0		
Max. connection distance between servos	When connected to open collector: 2m When connected to differential driver: 10m		When connected to open collector: 2m When connected to differential driver:		0	
Internal current consumption (A) (5VDC)	0.7A or less	QD75P1N: QD75P2N: QD75P4N: 0.29A 0.30A 0.36A QD75D1N: QD75D2N: QD75D4N: 0.43A 0.45A 0.66A		- 0		
Flash ROM write count	Max. 100,000 times	Max. 100,000 times		0	When QD75P□N/ QD75D□N carries out the flash write 26 times from the sequence program, an error occurs. The error reset enables to perform the flash write.	
Occupied I/O points	32 points (I/O assignment: special 32 points)	32 points (I/O assignment: intelligent 32 points)		0		
No. of module occupied slots	1		1		0	
Weight	0.35kg	QD75P1N: 0.14kg QD75D1N: 0.15kg	QD75P2N: 0.14kg QD75D2N: 0.15kg	QD75P4N: 0.16kg QD75D4N: 0.16kg	- 0	

O : Compatible, \triangle : Partial change required, \times : Incompatible

					0.00	Jan. 10, — 1 1 a. t.	ar orialigo re	quireu, ^. incompatible
Item	Model	AD75P1-S3 AD75P2-S3 AD75	5P3-S3	QD75P1N QD75D1N	QD75P2N QD75D2N	QD75P4N QD75D4N	Compat- ibility	Precautions for replacement
I/O signal for external	STRT signal	O(External start signal)		× (integrated into CHG)				When using both the speed-position switching control and the external start, input the external start signal to the interrupt module, and start using the direct output.
devices	CHG signal	Speed-position switching sign	Speed-position switching signal start or speed		External command signal (External start or speed-position switching selectable with parameters)		0	
	in-Position (INP)	O(for monitor)		×			Δ	No INP signal. When it is required for monitor, monitor using the input module.
	Signal logic switching	Command pulse output signal	only		0		0	The default logic of pulse output differs.
Peripheral	Connection with peripheral devices			Connection via programmable controller CPU, Q corresponding serial communication module, Q corresponding MELSECNET/H remote		0	The connecting shape differs.	
devices (data setting, etc.)	AD75TU	0		×		×	AD75TU cannot be used. Use GX Configurator-QP.	
	GX Configurator	GX Configurator-AP		GX Configurator-QP		Δ	Available GX Configurator differs.	

^{*1} With AD75P□-S3, Nos.1 to 100 data items/axis of positioning data can be set using the buffer memory and Nos.1 to 600 data/axis can be set with QD75P□N/QD75D□N.

The positioning data in the buffer memory is not backed up.

 $QD75P \square N/QD75D \square N \ does \ not \ have \ address \ pass \ mode. \ When being \ asked for passing \ the \ positioning \ address, \ continue \ with \ continuous \ running. \ (However, it \ will \ stop \ once.)$

^{*2} Indicates the standard mode/stepping motor mode about AD75P□-S3.

^{*3} The near pass function is valid only during the continuous path control. (AD75P□-S3: Selected with parameters, QD75P□N/QD75D□N: Standard function)

7.4.2 Function comparison

(1) Deleted function from AD75P1-S3/P2-S3/P3-S3

When using the following function on AD75P□-S3, change the program.

Deleted functions	Precautions for replacement
Stepping motor mode	The setting is not required when using stepping motor due to it's performance gain.
Fast machine OPR	With the QD75P\(\text{DN/QD75D}\(\text{DN}\), there is no possible function for replacement.
Special start (stop)	Execute it separately for the start two times.
	In the QD75P\(\text{DN/QD75D\(\text{DN}\)}\), the start block area on the buffer memory is expanded to five blocks (0
Indirect designation	to 4).
	Each start block can be directly designated with positioning start No. (7000 to 7004).
Block transfer	With the AD75P□-S3, this interface is used to set positioning data Nos. 101 to 600 that do not exist
	on the buffer memory.
Positioning data I/F	Since all positioning data can be set in the buffer memory with the QD75P□N/QD75D□N, this
	function is deleted.
Ctart history during arrara	The contents are the same as the start history.
Start history during errors	Therefore, the QD75P□N/QD75D□N stores only the start history.
System monitor data	These data were deleted because they can be displayed in system monitor "Module's detailed
System monitor data	information" of GX Developer.
(Module name, OS type, OS version)	(Refer to GX Developer Operating Manual.)

(2) Changed function from AD75P1-S3/P2-S3/P3-S3

In case of using the following functions with AD75P \square -S3, make sure that there is no operation problems when converted to QD75P \square N/QD75D \square N.

Changed functions		Change description					
	1. The limit check of arc address is		designated.				
	It is not carried out when a center point is designated.						
	The software stroke limit check during speed control is carried out in the following cases:						
		pplied to the current feed value with					
	updated with Pr.21						
	When the software stroke limit is a	pplied to the machine feed value					
Software stroke limit	If an attempt is made to change the limit range, the attempt is consider	he current value but the designated a ered as an error and the current value					
function	4. Error code change		3				
	AD75P□-S3:						
	There are 3 types of errors for ea	ch upper and lower stroke limit.					
	(error code 509 to 512)						
	QD75P□N/QD75D□N:						
	Errors for the software stroke upp	per limit are integrated in to error cod	e 507.				
	Errors for the lower limit are integ						
	Error codes 509 to 512 are delete						
Current value changing M	1. An error occurs when the designation	ated new current value is out of the s	oftware stroke limit range.				
code function	2. The M code setting value is valid	during the positioning data current v	alue changing instruction.				
	1. An error occurs when the comma	ind frequency value calculated from t	the speed limit value exceeds the				
Acceleration/deceleration	maximum command frequency of the positioning module being used.						
speed control	Only two-word type (1 to 8388608ms) can be used as the setting value for the acceleration/deceleration						
	time.						
	1. "Peripheral side (emergency) stop" is deleted from the stop causes of Stop group 2 "sudden stop						
	selection".						
Stop process and restart	"Test mode fault" in the stop causes of Stop group 3 "sudden stop selection" is changed to be in the stop						
after stop positioning	causes of Stop group 2 "sudden stop selection".						
operation stop	2. "Stop (QD75 peripheral)" is added to the stop causes of Stop group 3 "sudden stop selection".						
	3. Error code 100 (Peripheral device stop during operation) is deleted.						
	4. "Programmable controller CPU error occurrence" is added to the stop causes of Stop group 2 Sudden stop						
	selection.	4.D75DE 00					
DEADY signal (VO)	055	AD75P□-S3	QD75P□N/QD75D□N				
READY signal (X0)	OFF ON	Normal (READY) Not READY/WDT error	Not READY/WDT error				
Manual pulse generator	ON	NOT READ 17/WDT effor	Normal (READY)				
operation	The No. of connectable manual pulse	e generator is changed from 1genera	ator/1axis to 1generator/1 module.				
Axis operation status	"Step stopped" is changed to "Stoppe	ed" and "Step error occurring" is char	nged to "Error occurring".				
	• AD75P□-S3:						
	If the reference axis operates in reverse direction, the control is internally changed into the continuous						
	positioning control. (restart after deceleration stop)						
Continuous path control	• QD75P□N/QD75D□N:						
	Even if the reference axis operates in reverse direction with interpolation, the control remains as the						
	continuous path control.						
		ation is the same as that of the AD75	P□-S3.)				
Near pass	For the continuous path control, only Positioning address pass is not cond						
2-axis interpolation	g and						
2-axis linear interpolation			_				
2-axis fixed-feed	The interpolation target axis can be r	andomly set with a positioning identi	tier.				
 Circular interpolation 							
· · · · · · · · · · · · · · · · · · ·	1						

Changed functions	Change description					
	1. "Step stopped" is changed to "Stopped" and "Step error occurring" is changed to "Error occurring" in the					
Stan function	axis operations status parameter	~S.				
Step function	2. The restart command for step sta	art information (02H) is deleted.				
	3. The step operation is restarted w	rith the restart command.				
Command in-position	The command in-position width is ex	rpanded.				
function	• AD75P□-S3: 1 to 32767000					
Tunction	QD75P□N/QD75D□N: 1 to 21474	483647				
Positioning start No.	7004 to 7010 (block start designation) and 8000 to 8049 (indirect designation) are deleted.					
block start data	With QD75P□N/QD75D□N, number of blocks has been change to 5 (7000 to 7004).					
DIOCK Start data	(With the AD75P□-S3, this data is c	alled "Positioning start information".)				
Start history	The configuration of "start informatio	n" and "start No." is changed so that t	he start No. can be directly checked.			
Basic parameter1	When the programmable controller is	s turned ON or the programmable co	ntroller CPU module is reset, the			
"Pr.5 Pulse output mode"	valid value is only the first value afte	r the programmable controller READ	Y signal (Y0) turns from OFF to ON.			
		AD75P□-S3	QD75P□N/QD75D□N			
Detailed parameters	0	Software stroke limits invalid for	Software stroke limits valid for			
"Pr.15 Software stroke limit	(Factory setting)	manual operation	manual operation			
valid/invalid setting"	1	Software stroke limits valid for	Software stroke limits invalid for			
	l	manual operation	manual operation			

7.4.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals or sequence program, refer to the Type QD75P/QD75D Positioning Module User's Manual.

Inp	out (X)		Output (Y)			
Signal name	AD75P□-S3	QD75P□N/ QD75D□N	Signal name	AD75P□-S3	QD75P□N/ QD75D□N	
(QD75/AD75) READY	X00*	X00*	Axis 1 Positioning start	Y10	Y10	
Axis 1 Start complete	X01	X10	Axis 2 Positioning start	Y11	Y11	
Axis 2 Start complete	X02	X11	Axis 3 Positioning start	Y12	Y12	
Axis 3 Start complete	X03	X12	Axis 4 Positioning start	-	Y13	
Axis 4 Start complete	-	X13	Axis 1 Stop	Y13	Y04	
Axis 1 BUSY	X04	X0C	Axis 2 Stop	Y14	Y05	
Axis 2 BUSY	X05	X0D	Axis 3 Stop	Y1C	Y06	
Axis 3 BUSY	X06	X0E	Axis 4 Stop	-	Y07	
Axis 4 BUSY	-	X0F	Axis 1 Forward run JOG start	Y16	Y08	
Axis 1 Positioning complete	X07	X14	Axis 1 Reverse run JOG start	Y17	Y09	
Axis 2 Positioning complete	X08	X15	Axis 2 Forward run JOG start	Y18	Y0A	
Axis 3 Positioning complete	X09	X16	Axis 2 Reverse run JOG start	Y19	Y0B	
Axis 4 Positioning complete	-	X17	Axis 3 Forward run JOG start	Y1A	Y0C	
Axis 1 Error detection	X0A	X08	Axis 3 Reverse run JOG start	Y1B	Y0D	
Axis 2 Error detection	X0B	X09	Axis 4 Forward run JOG start	-	Y0E	
Axis 3 Error detection	X0C	X0A	Axis 4 Reverse run JOG start	-	Y0F	
Axis 4 Error detection	-	X0B	Programmable controller READY	Y1D	Y00	
Axis 1 M code ON	X0D	X04	Axis 1 Execution prohibition flag	-	Y14	
Axis 2 M code ON	X0E	X05	Axis 2 Execution prohibition flag	-	Y15	
Axis 3 M code ON	X0F	X06	Axis 3 Execution prohibition flag	-	Y16	
Axis 4 M code ON	-	X07	Axis 4 Execution prohibition flag	-	Y17	
Synchronization flag	-	X01		V00 to V05	Y01 to Y03	
Not used	X10 to X1F	X02, X03 X18 to X1F	Not used	Y00 to Y0F Y1E to Y1F	Y18 to Y1F	

^{*} The ON/OFF statuses for READY are different between the QD75P□N/QD75D□N and AD75P□-S3.

	Not READY/WDT error	READY		
QD75P□N/	OFF	ON		
QD75D□N	OFF	ON		
AD75P□-S3	ON	OFF		

7.4.4 Buffer memory address comparison

For details of the buffer memory or sequence program, refer to the Type QD75P/QD75D Positioning Module User's Manual.

area shows the differences between AD75P□-S3 and QD75P□N/QD75D□N.

	Buffer memory address							
Item of AD75P□-S3	AD75P□-S3			QD75P□N/QD75D□N				
	Axis 1	Axis 2	Axis 3	Axis 1	Axis 2	Axis 3		
Pr.1 Unit setting	0	150	300	0	150	300		
Pr.2 1 No. of pulses per rotation (Ap)	1	151	301	1	151	301		
Pr.3 1 Movement amount per rotation (AI)	2	152	302	2	152	302		
Pr.4 Unit magnification (Am)	3	153	303	3	153	303		
Pr.5 Pulse output mode	4	154	304	4	154	304		
Pr.6 Rotation direction setting	5	155	305	5	155	305		
Pr.7 Speed limit value	6	156	306	10	160	310		
	7	157	307	11	161	311		
Pr.8 Acceleration time 0	8 9	158 159	308 309	12 13	162 163	312 313		
	10	160	310	14	164	314		
Pr.9 Deceleration time 0	11	161	311	15	165	315		
	12	162	312	6	156	306		
Pr.10 Bias speed at start	13	163	313	7	157	307		
Pr.11 Stepping motor mode selection amount	14	164	314	-	-	-		
Pr.12 Backlash compensation amount	15	165	315	17	167	317		
Pr.13 Software stroke limit upper limit value	16	166	316	18	168	318		
	17	167	317	19	169	319		
Pr.14 Software stroke limit lower limit value	18 19	168 169	318 319	20 21	170 171	320 321		
Pr.15 Software stroke limit selection	20	170	320	22	172	322		
Pr.16 Software stroke limit valid/invalid setting	21	171	321	23	173	323		
	22	172	322	24	174	324		
Pr.17 Command in-position width	23	173	323	25	175	325		
Pr.18 Torque limit setting value	24	174	324	26	176	326		
Pr.19 M code ON signal output timing	25	175	325	27	177	327		
Pr.20 Speed switching mode	26	176	326	28	178	328		
Pr.21 Interpolation speed designation method	27	177	327	29	179	329		
Pr.22 Current feed value during speed control	28	178	328	30	180	330		
Pr.23 Manual pulse generator selection	29	179	329	-	-	-		
Pr.24 Logic selection for pulse output to the drive unit	30	180	330	-	-	-		
Pr.25 Size selection for acceleration/deceleration time	31	181	331	-	-	-		
Pr.26 Acceleration time 1	36 37	186 187	336 337	36 37	186 187	336 337		
Pr.27 Acceleration time 2	38 39	188 189	338 339	38 39	188 189	338 339		
Deal Association time 0	40	190	340	40	190	340		
Pr.28 Acceleration time 3	41	191	341	41	191	341		
Pr.29 Deceleration time 1	42 43	192 193	342 343	42 43	192 193	342 343		
	40	130	0-10	70	190	0-10		

	Buffer memory address						
Item of AD75P□-S3		D□N					
	Axis 1	Axis 2	Axis 3	Axis 1	Axis 2	Axis 3	
Pr.30 Deceleration time 2	44	194	344	44	194	344	
T1.50 Bedderaudt unte 2	45	195	345	45	195	345	
Pr.31 Deceleration time 3	46	196	346	46	196	346	
	47 48	197 198	347 348	47 48	197 198	347 348	
Pr.32 JOG Speed limit value	49	199	349	49	199	349	
Pr.33 JOG operation acceleration time selection	50	200	350	50	200	350	
Pr.34 JOG operation deceleration time selection	51	201	351	51	201	351	
Pr.35 Acceleration/deceleration process selection	52	202	352	52	202	352	
Pr.36 S-pattern proportion	53	203	353	53	203	353	
Pr.37 Sudden stop deceleration time	54	204	354	54	204	354	
11.51 Studen stop deceleration time	55	205	355	55	205	355	
Pr.38 Stop group 1 sudden stop selection	56	206	356	56	206	356	
Pr.38 Stop group 2 sudden stop selection	57	207	357	57	207	357	
Pr.40 Stop group 3 sudden stop selection	58	208	358	58	208	358	
Pr.41 Positioning complete signal output time	59	209	359	59	209	359	
Pr.42 Allowable circular interpolation error width	60 61	210	360	60 61	210 211	360 361	
Pr.43 External start function selection	01	211	361	01	211	361	
	62	212	362	62	212	362	
(QD75PDN/QD75DDN: Pr.42 External command function selection)				-			
		04.0	200				
Pr.44 Near pass mode selection for path control	66	216	366	-	-	-	
Pr.45 OPR method	70	220	370	70	220	370	
Pr.46 OPR direction	71	221	371	71	221	371	
Pr.37 OP address	72 72	222	372	72	222	372	
	73 74	223 224	373 374	73 74	223 224	373 374	
Pr.48 OPR speed	75	225	375	74 75	225	375	
	76	226	376	76	226	376	
Pr.49 Creep speed	77	227	377	77	227	377	
Pr.50 OPR retry	78	228	378	78	228	378	
Pr.51 OPR dwell time	79	229	379	79	229	379	
Pr.52 Setting for the movement amount after near-point dog	80	230	380	80	230	380	
ON	81	231	381	81	231	381	
Pr.53 OPR acceleration time selection	82	232	382	82	232	382	
Pr.54 OPR deceleration time selection	83	233	383	83	233	383	
Pr.55 OP shift amount	84	234	384	84	234	384	
	85 86	235	385	85	235	385	
Pr.56 OPR torque limit value	86	236	386	86	236	386	
Pr.57 Speed designation during OP shift	88	238	388	88	238	388	
Pr.58 Dwell time during OPR retry	89	239	389	89	239	389	

		Buffer memory address				
Item of AD75P□-S3		AD75P□-S3	QD75P□N/QD75D□N			
		Common for axis 1, 2, 3	Common for axis 1, 2, 3, 4			
Md.1 In test mode flag		450	1200			
Md.2 Module name		451	-			
Md.3 OS type		452 453 454 455	-			
Md.4 OS version		456 457	-			
Md.5 Clock data (hour: minute)		460	-			
Md.6 Clock data (second: 100 ms)		461	-			
(Pointer number)		(0) t	o (15)			
Md.7 Start axis			10101 100-			
(QD75PDN/QD75DDN: Md.3 Start information)		462 to 537	1212 to 1287			
Md.8 Operation type		462 to 529	1212 to 1200			
(QD75P□N/QD75D□N: Md.4 Start No.)	ory	463 to 538	1213 to 1288			
Md.9 Start Hour: minute	Start history	464 to 539	1214 to 1289			
(QD75P□N/QD75D□N: Md.5 Start Hour)	Starl	404 10 000	1214 (0 1209			
Md.10 Start Second: 100 ms		465 to 540	1215 to 1290			
(QD75PDN/QD75DDN: Md.6 Start Minute: second)		400 to 040	1210 to 1200			
Md.11 Error judgment		466 to 541	1216 to 1291			
Md.12 Start history pointer		542	1292			
(Pointer number)		(0) to (15)	-			
Md.13 Start axis	rrors	543 to 618	-			
Md.14 Operation type	Start history during errors	544 to 619	-			
Md.15 Start Hour: minute	y dur	545 to 620	-			
Md.16 Start Second: 100 ms	istor	546 to 621	-			
Md.17 Error judgment	tart h	547 to 622	-			
Md.18 Start history storage during error	o)	623	-			
(Pointer number)		(0) t	o (15)			
Md.19 Axis in which the error occurred		624 to 684	1293 to 1353			
Md.20 Axis error No.		625 to 685	1294 to 1354			
Md.21 Axis error occurrence Hour: minute	<u> </u>					
(QD75PDN/QD75DDN: Md.11 Axis error occurrence	Error history	626 to 686	1295 to 1355			
(Hour))	rror					
Md.22 Axis error occurrence Second: 100 ms	"					
(QD75PDN/QD75DDN: Md.12 Axis error occurrence		627 to 687	1296 to 1356			
(Minutes: second))						
Md.23 Error history pointer		688	1357			

Item of AD75P□-S3		Buffer memory address		
		AD75P□-S3	QD75P□N/QD75D□N	
		Common for axis 1, 2, 3	Common for axis 1, 2, 3, 4	
(Pointer number)		(0) to (15)		
Md.24 Axis in which the warning occurred	Warning history	689 to 749	1358 to 1418	
Md.25 Axis warning No.		690 to 750	1359 to 1419	
Md.26 Axis warning occurrence Hour: minutes		691 to 751	1360 to 1420	
(QD75PDN/QD75DDN: Md.16 Axis warning				
occurrence (Hour))				
Md.27 Axis warning occurrence Second: 100 ms		3692 to 752	1361 to 1421	
(QD75PDN/QD75DDN: Md.17 Axis warning				
occurrence (Minutes: second))				
Md.28 Warning history pointer		753	1422	

	Buffer memory address						
Item of AD75P□-S3		AD75P□-S3			5P□N/QD75	D□N	
	Axis 1	Axis 2	Axis 3	Axis 1	Axis 2	Axis 3	
Md.29 Current feed value	800	900	1000	800	900	1000	
Wa.25 Sanshi 1664 Valdo	801	901	1001	801	901	1001	
Md.30 Machine feed value	802 803	902 903	1002 1003	802 803	902 903	1002 1003	
	804	904	1003	804	904	1003	
Md.31 Feedrate	805	905	1005	805	905	1005	
Md.32 Valid M code	806	906	1006	808	908	1008	
Md.33 Axis error No.	807	907	1007	806	906	1006	
Md.34 Axis warning No.	808	908	1008	807	907	1007	
Md.35 Axis operation status	809	909	1009	809	909	1009	
Md.36 Current speed	810	910	1010	810	910	1010	
our ent speed	811	911	1010	811	911	1011	
Md.37 Axis feedrate	812	912	1012	812	912	1012	
	813 814	913 914	1013 1014	813 814	913 914	1013 1014	
Md.38 Speed-position switching control positioning amount	815	915	1015	815	915	1015	
Md.39 External input/output signal	816	916	1016	816	916	1016	
Md.40 Status	817	917	1017	817	917	1017	
Tanah valua	818	918	1018	818	918	1018	
Md.41 Target value	819	919	1019	819	919	1019	
Md.42 Target speed	820	920	1020	820	920	1020	
	821 822	921 922	1021 1022	821	921	1021	
Md.43 OP absolute position	823	923	1022	-	-	-	
	824	924	1024	824	924	1024	
Md.44 Movement amount after near-point dog ON	825	925	1025	825	925	1025	
Md.45 Torque limit stored value	826	926	1026	826	926	1026	
Md.46 Special start data instruction code setting value	827	927	1027	827	927	1027	
Md.47 Special start data instruction parameter setting value	828	928	1028	828	928	1028	
Md.48 Start positioning data No. setting value	829	929	1029	829	929	1029	
Md.49 In speed control flag	830	930	1030	830	930	1030	
Md.50 In speed change processing flag	831	931	1031	831	931	1031	
Md.51 Start data pointer being executed	832	932	1032	834	934	1034	
Md.52 Last executed positioning data No.	833	933	1033	837	937	1037	
Md.53 Repetition counter							
(QD75PDN/QD75DDN: Md.41 Special start repetition	834	934	1034	832	932	1032	
counter)							
Md.54 Positioning data No. being executed	835	935	1035	835	935	1035	
Md.55 Block No. being executed	836	936	1036	836	936	1036	
Md.56 Positioning data being executed	838 to 847	938 to 947	1038 to 1047	838 to 847	938 to 947	1038 to 1047	
Deceleration starting flag	-	-	-	899	999	1099	

	Buffer memory address						
Item of AD75P□-S3		AD75P□-S3			5P□N/QD75		
	Axis 1	Axis 2	Axis 3	Axis 1	Axis 2	Axis 3	
Cd.1 Clock data setting (hour)		1100			-		
Cd.2 Clock data setting (minute, second)		1101			-		
Cd.3 Clock data writing		1102			-		
Cd.4 Target axis		1103			-		
Cd.5 Positioning data No.		1104			-		
Cd.6 Write pattern		1105			-		
Cd.7 Read/write request		1106			-		
Cd.8 Read/write positioning data I/F		1108 to 1137			-		
Cd.9 Flash ROM write request		1138			1900		
Cd.10 Parameter initialization request		1139			1901		
Cd.11 Positioning start No.	1150	1200	1250	1500	1600	1700	
Cd.12 Axis error reset	1151	1201	1251	1502	1602	1702	
Cd.13 Restart command	1152	1202	1252	1503	1603	1703	
Cd.14 M code OFF request	1153	1203	1253	1504	1604	1704	
Cd.15 New current value	1154	1204	1254	1506	1606	1706	
Cu. 15 New Current Value	1155	1205	1255	1507	1607	1707	
Cd.16 New speed value	1156 1157	1206 1207	1256 1257	1514 1515	1614 1615	1714 1715	
Cd.17 Speed change request	1158	1208	1258	1516	1616	1716	
Cd.18 Positioning operation speed override	1159	1209	1259	1513	1613	1713	
Cd 10 IOC around	1160	1210	1260	1518	1618	1718	
Cd.19 JOG speed	1161	1211	1261	1519	1619	1719	
Cd.20 Speed-position switching enable flag	1163	1213	1263	1528	1628	1728	
Cd.21 Speed-position switching control movement amount	1164 1165	1214 1215	1264	1526	1626 1627	1726	
change register			1265	1527		1727	
Cd.22 Manual pulse generator enable flag	1167 1168	1217 1218	1267 1268	1524 1522	1624 1622	1724 1722	
Cd.23 Manual pulse generator 1 pulse input magnification	1169	1219	1269	1522	1623	1722	
Cd.24 OPR return request flag OFF request	1170	1220	1270	1521	1621	1721	
Cd.25 External start valid							
(QD75PDN/QD75DDN: Cd.8 External command valid)	1171	1221	1271	1505	1605	1705	
Cd.26 Step valid flag	1172	1222	1272	1545	1645	1745	
Cd.27 Step mode	1173	1223	1273	1544	1644	1744	
Cd.28 Step start information	1174	1224	1274	1546	1646	1746	
Cd.29 Skip command	1175	1225	1275	1547	1647	1747	
Cd.30 New torque value	1176	1226	1276	1525	1625	1725	
Cd.31 Positioning starting point No.	1178	1228	1278	1501	1601	1701	
Cd.32 Interrupt request during continuous operation	1181	1231	1281	1520	1620	1720	
	1184	1234	1284	1508	1608	1708	
Cd.33 New acceleration time value	1185	1235	1285	1509	1609	1709	
Cd.34 New deceleration time value	1186 1187	1236 1237	1286 1287	1510 1511	1610 1611	1710 1711	
Cd.35 Acceleration/deceleration time change during speed change, enable /disable selection	1188	1238	1288	1512	1612	1712	

								Buff	er mem	ory add	ress				
		Item of AD75P□-S3					P□-S3					75P□N			
				Ax	is 1	Axi	is 2	Axi	is 3	Ax	is 1	Ax	is 2	Ax	is 3
	Da	.1 Operation pattern													
	Da	.2 Control system													
	Da	.3 Acceleration time No.		13	00	23	00	33	800	2000		80	00	140	000
ļ	Da	.4 Deceleration time No.													
	Da	.5 M code/condition data		13	01	2301		33	801	20	01	80	01	140	001
	No.														
	Da	.8 Dwell time/JUMP	No.1	13	02	23	02	33	802	20	02	80	02	140	002
*	dest	ination positioning data No.													
Positioning data*1	Emp	oty			03	23		33			03		03		003
ning	Da	.7 Command speed			04	23			306 207		04		04 05		004
sition					05 06	23 23		33			05 06		06		005 006
Pos		5 Positioning address/			i00 i07	23			306 307		07		07		007
ļ	mov	ement amount			108	23			308		08		08		008
	Da	.6 Arc address			09	23			809	20			09		009
		No 2		1210+	o 1210	2240 +	. 2210	2240+	a 2210	2010 +	- 2010	00104	o 0010	14010 to	
	No.2			13101	o 1319	2310 to 2319		3310 to 3319		2010 to 2019		8010 to 8019		14019	
	No.3			1320 t	o 1329	2320 t	o 2329	3320 t	o 3329	2020 to 2029		8020 t	o 8029		20 to
		to			to		0		to	to		to		14029 to	
	to			'	10	·	.0	·	10	1	.0	'	.0	1	90 to
		No.100		2290 t	o 2299	3290 t	o 3299	4290 t	o 4299	2990 t	o 2999	8990 t	o 8999		999
		Da.10 Shape													
		Da.11 Start data No.													
	a [*] 2	Da.12 Special start	1st	4300	4350	4550	4600	4800	4850	26000	26050	27000	27050	28000	28050
	dat	instruction	point												
	Start block data	Da.13 Parameter													
	art k	2nd point		4301	4351	4551	4601	4801	4851	26001	26051	27001	27051	28001	28051
	ಶ	3rd point		4302	4352	4552	4602	4802	4852		26052	27002	27052		
*ر		to		1	to	t	0	t	to	1	:0	1	:0	1	to
atior		50th point	1	4349	4399	4599	4649	4849	4899	26049	26099	27049	27099	28049	28099
Positioning start information*3		Da.14 Condition target		11	.00	46	50	10	000	26.	100	27	100	28.	100
ıt ii		Da.15 Condition operator			.00	10	50	43	,00	20	100		100	20	100
) sta		D . 40 Address		44	02	46	52	49	002	26	102	27	102	28	102
ning		Da.16 Address	No.1		03		53		003		103		103		103
sitio	æ	Da.17 Parameter 1			04		54		004		104		104		104
Po	data				.05 .06	46			005		105		105		105
	ition	Da.18 Parameter 2													
	No.2		l							26107 26110 to				28107 28110 to	
			4410 t	0 4419	4660 to	0 4669	4910 to 4919		26119		27	119	28	119	
		No 3		4420 t	o 4429	4670 to	o 4679	4920 to 4929		26120 to		27120 to			20 to
ļ														1	129
ļ		to		1	O	t	0	t	10						
ļ		No.10		4490 t	o 4499	4740 t	o 4749	4990 t	o 4999		199				199
	Condition	No.2 No.3		4406 4407 4410 to 4419 4420 to 4429 to 4490 to 4499		4656 4657 4660 to 4669 4670 to 4679 to 4740 to 4749		4910 to 4919 2611 4920 to 4929 2612 to to to 4999 2619		107 10 to 119 20 to 129 50	27106 27107 27110 to 27119 27120 to 27129 to 27190 to 27199		28 ³ 281 281 281 281 281 281	10 to 119 20 to 129 to 90 to	

^{*1} With the QD75P\(\text{DN/QD75D\(\text{DN}\)}\), the positioning data buffer memory addresses are Nos. 1 to 600.

^{*2} With the QD75P\(\text{D}\)N/QD75D\(\text{D}\)N, it is called [block start data].

With the QD75P\(\text{D}\)N/QD75D\(\text{D}\)N, the [block start data] and [condition data] in \(\text{the area are called [start block 0].}\) There are five start blocks: 0 to 4

				Buffer memory address						
Iten	n of A	D75P□-S3		AD75P□-S3	}	QD7	QD75P□N/QD75D□N			
			Axis 1	Axis 2	Axis 3	Axis 1	Axis 2	Axis 3		
	n	Start No.8001	4500	4750	5000	-	-	-		
Positioning start	t ation	Start No.8002	4501	4751	5001	-	-			
information	Indirect	to	to	to	to	to	to	to		
	lnd des	Ctart No 00E0	4549	4799	5049	-	-	-		
Drogrammable controller	CDLL	Condition in demonstrates data	5050			30000				
Programmable controller	CPU	Condition judgment target data of the condition data		to			to			
memory area		of the condition data		5099			30099			
Target axis				5100			-			
Head positioning block N	lo.			5101		-				
No. of read/write data items			5102			-				
Read/write request				5103		-				
Read/write block				5110 to 6109)		-			

7.4.5 Interface specifications comparison with external devices

For the external interface specifications, the following shows the differences between AD75P□-S3 and QD75P□N/QD75D□N.

O : Compatible, △ : Partial change required

	Item ^{*1}	Differences as Interface specifications*2	Compat- ibility	Precautions for replacement
	Drive unit READY	-	0	
	Upper/lower limit signal	-	0	
	Stop signal	-	0	
Input	Near-point dog signal	Input resistance: $4.7k\Omega\rightarrow4.3k\Omega$ Response time: $4ms\rightarrow1ms$	Δ	<when for="" is="" machine="" method="" near-point="" opr="" signal="" the="" used="" watchdog=""> The input response time for the QD75P□N/QD75D□N is shorter than the A1SD75P□-S3. If a sensor, which the chattering time when the near-point watchdog signal is turned on is long, is used, an error may occurs due to the false detection of the ON/OFF status.*4 Check specifications for the sensor.</when>
	Speed-position switching signal	Input resistance: $4.7k\Omega \rightarrow 7.7k\Omega$ Response time: $4ms \rightarrow 1ms$	Δ	
	Zero signal	Input resistance: $3.5 \text{k}\Omega \rightarrow 4.7 \text{k}\Omega$ (at input of 24V) $0.5 \text{k}\Omega \rightarrow 0.62 \text{k}\Omega$ (at input of 5V) Response time: $0.8 \text{ms} \rightarrow 1 \text{ms}^{*3}$ ON voltage: $2.5 \text{V} \rightarrow 2.0 \text{V}$ (at input of 5V)	Δ	Including the response time differences, reconfirming is required.
	Manual pulse generator	ON current: 3.5mA→2mA	0	
Output	Pulse	-	0	
Catput	Deviation counter clear	-	0	

- *1 For the external start and in-position signal of which QD75P\(\text{DN/QD75D}\(\text{DN}\) does not have, they are not described.
- *2 The column of interface specifications differences is described as the form, [Specifications of AD75P \square -S3] \rightarrow [Specifications of QD75P \square N/QD75D \square N].
- *3 The response time difference (0.2 ms) of AD75P□-S3 and QD75P□N/QD75D□N is the time difference of 1pls part for creep speed of 5000pps.
 - When the accuracy is required, it is required for the creep speed to be low enough value.
- *4 If the chattering time is long when the near-point watchdog signal is turned on, the OFF status may be detected shortly after the ON status of the signal is detected (under changing into the creep speed). In this case, the QD75P\(\text{D}\text{N}/\text{QD75P\(\text{D}\text{N}}\) outputs an error and stops the OPR control.

7.5 AD75M1/M2/M3

7.5.1 Performance comparison

O: Compatible, \triangle : Partial change required, \times : Incompatible

No. of control axes	ecautions for eplacement
No. of positioning data items Position control interpolation functions Position control Position control Position functions Position control Positioning control Position Positioning control Position Positioning control Positionin	
Position 2-axis linear	
control interpolation interpolation functions interpolation 2-axis circular interpolation x O X O O Position control Position control O	
Positioning system Sinterpolation 2-axis circular interpolation	
Control Speed control O Speed- Positioning system Speed- Spee	
Positioning system Speed- position Switching O	
Positioning system Position Switching O	
control	
Position- speed switching control	
In Absolute system>	
Speed command range 0.01 to 6000000.00 (mm/min) 0.001 to 20000000.00 (mm/min) 0.001 to 20000000.00 (inch/min) 0.001 to 2000000.000 (inch/min) 0.001 to 600000.000 (degree/min) 0.001 to 2000000.000 (degree/min) 1 to 1000000 (PLS/s) 1 to 10000000 (PLS/s)	
Machine OPR function (OPR methods) O(4 OPR methods) O(4 OPR methods) O(4 OPR methods) A Return than on at the e	ponding to the passed error is ed. the motor more ne rotation once error and perform PR start again.
JOG operation O O	

O : Compatible, \triangle : Partial change required, \star : Incompatible

		·			0.001	ipatible, \triangle . I a	rtial orialigo	required, x: incompatible
Item	Model	AD75M1 AD75M2	AD75M3	QD75M1	QD75M2	QD75M4	Compati- bility	Precautions for replacement
Manual pulse generator function		1 generator/axis		1 generator/module		Δ	On QD75M□, the manual pulse generator cannot be used by each axis independent. When connecting the manual pulse generator for each axis is required, use one axis module. The manual pulse generator itself can use the same one. The operation for inputting one pulse differs. Set the parameter so that movement amount may be same.	
Acceleration/ deceleration Automatic trapezoidal acceleration/ deceleration		0			0		0	
processing	S-pattern acceleration/ deceleration	0			0			
Acceleration/ No. of patterns deceleration				Acceleration time and deceleration time can be set independently. (4 patterns each)			0	
action time	setting range	1 to 65535ms/1 to 8388608n enabled	is switching is		to 8388608ms	;		
Compensation		Electronic gears, backlash c	ompensation,	Electronic ge	ars, backlash co	ompensation,	Δ	Refer to *2.
Error display		17-segment LEI)	Error LED			×	For details of diagnostic, use GX Developer.
History data sto	•	Provided (4 types, 16 iten	ns/module)	Provided (3 types, 16 items/module)			0	The start history during error is integrated into the start history.
Data storage d	estination	Flash ROM (battery-less back	up)	(ba	Flash ROM ttery-less backı	ıb)	0	
		10136-3000VE (Soldering type, sup		A6CON1, A6CON4 (Soldering type, sold separately)				
Connection cor	nnector	10136-6000EL (Crimping type, sold se	parately)		A6CON2 g type, sold sep DC type, sold s		×	As the connectors differ, wiring change is
		10136-3000VE: 24 to 3 (approx. 0.05 to 0.2) 10136-6000EL: 28	mm²)	A6COI	N1, A6CON4: 0.	.3mm ²		required. The connectors of QD75M□ is sold
Applicable wire	e size	(approx. 0.08mm	_		ON2: 24 to 28 A		0	separately.
		-			: 28 AWG (twist AWG (single wi			
SSCNET conn			Refer to Sect	tion 7.5.5 (3).				The connector
of SSCNET			30	ım			Δ	configuration of bass differs.
Internal current consumption(A		0.7A or less		QD75M1 : 0.40A	QD75M2 : 0.40A	QD75M4 : 0.40A	0	
consumption(A) (5VDC) Flash ROM write count		Max. 100,000 tim	es	M	ax. 100,000 time	es	0	When QD75M carries out the flash write 26 times from the sequence program, an error occurs. The error reset enables to perform the flash write.

O: Compatible, \triangle : Partial change required, \times : Incompatible

	Model	AD75M1	AD75M2	AD75M3	QD75M1	QD75M2	QD75M4	Compati-	Precautions for
Item								bility	replacement
I/O points		(I/O assig	32 points nment: special	32 points)	(I/O assign	32 points ment: intelligen	t 32 points)	0	
No. of module occupied slots			1			1		0	
Weight			0.35kg		0.15kg	0.15kg	0.16kg	0	
I/O signal for external devices	START signal	0		× (integrated into CHG)			Δ	When using both the speed-position switching control and the external start, input the external start signal to the interrupt module and start using the direct output.	
	CHG signal	Speed-p	Speed-position switching signal		External command signal (External start or speed-position switching selectable with parameters)		0		
novinhoval	Connection with peripheral devices	Direct connection		Connection via programmable controller CPU, Q corresponding serial communication module, Q corresponding MELSECNET/H remote I/O module		g serial orresponding	0	The connecting shape differs.	
peripheral devices (data setting, etc.)	AD75TU		Available		Unavailable			×	AD75TU cannot be used. Use GX Configurator-QP.
	GX Configurator	G	K Configurator-	AP	GX Configurator-QP*3			0	Available GX Configurator differs.

^{*1} Nos.1 to 100 data items/axis of positioning data can be set using the buffer memory and Nos.1 to 600 data/axis can be set with QD75M□.

The positioning data in the buffer memory is not backed up.

^{*2} The near pass function is valid only during the continuous path control. (AD75M□: Selected with parameters, QD75M□: Standard function)

QD75MD does not have address pass mode. If passing the positioning address, continue with continuous operation. (However, it will stop once.)

^{*3} GX Configurator-QP is available with SW2D5C-QD75P or later version.

7.5.2 Function comparison

(1) Deleted function from AD75M1/AD75M2/AD75M3

When using the following function on AD75M \square -S3, change the program.

Deleted functions	Precautions for replacement					
Creep speed out of range error	With QD75M□, there is no the error code of the left column.					
(error code: 208)	42					
Fast machine OPR	With the Q75M□, there is no possible function for replacement.					
Special start (stop)	Execute it separately for the start two times.					
Indirect designation	In the QD75M□, the start block area on the buffer memory is expanded to five blocks (0 to 4). Each					
	start block can be directly designated with positioning start No. (7000 to 7004).					
Block transfer	With the AD75M□, this interface is used to set positioning data Nos. 101 to 600 that do not exist on					
Positioning data I/F	the buffer memory. Since all positioning data can be set in the buffer memory with the QD75M□, this					
Positioning data I/P	function is deleted.					
Stort history during arrors	The contents are the same as the start history.					
Start history during errors	Therefore, the QD75M□ stores only the start history.					
System monitor data	These data were deleted because they can be displayed in system monitor "Module's detailed					
System monitor data	information" of GX Developer.					
(Module name, OS type, OS version)	(Refer to GX Developer Operating Manual.)					

(2) Changed function from AD75M1/AD75M2/AD75M3

In case of using the following functions with AD75M \square , make sure that there is no operation problems when converted to QD75M \square .

Changed functions		Change description					
	The software stroke limit chec		when a sub point is designated.				
	It is not carried out when a cer	•					
	2. The software stroke limit chec		ut in the following cases:				
	When the software stroke limit is applied to the current feed value with Pr.14 and the current feed						
	value is updated with Pr.21						
	When the software stroke limit is applied to the machine feed value						
	3. If an attempt is made to change the current value but the designated address is out of the						
Software stroke limit function	software stroke limit range, the attempt is considered as an error and the current value is not						
	changed.						
	4. Error code change						
	AD75MD:						
	• • • • • • • • • • • • • • • • • • • •	each upper and lower stroke limit	(error code 509 to 512)				
	QD75MD:	upper limit are integrated in to arre	or and a FO7				
		upper limit are integrated in to erro	or code 507.				
	Errors for the lower limit are in	•					
Current value changing M ands	Error codes 509 to 512 are de		the aeftware strake limit range				
Current value changing M code function		 An error occurs when the designated new current value is out of the software stroke limit range. The M code setting value is valid during the positioning data current value changing instruction. 					
Acceleration/deceleration speed control	Only two-word type (1 to 8388608ms) can be used as the setting value for the acceleration/						
Control	deceleration time. 1. "Peripheral side (emergency) stop" is deleted from the stop causes of Stop group 2 "sudden stop"						
	selection".	stop is deleted from the stop caus	ses of Stop group 2 Sudden Stop				
		auses of Stop group 3 "sudden sto	on soloction" is changed to be in				
Stop process and restart after stop	the stop causes of Stop group		op selection is changed to be in				
positioning operation stop		Ided to the stop causes of Stop gro	oun 3 "sudden ston selection"				
positioning operation stop		vice stop during operation) is dele	·				
	4. "Programmable controller CPU error occurrence" is added to the stop causes of Stop group 2						
	"Sudden stop selection".						
		AD75M□	QD75M□				
READY signal (X0)	OFF	Normal (READY)	Not READY/WDT error				
5	ON	Not READY/WDT error	Normal (READY)				
	The No. of connectable manual pr	ulse generator is changed from 1g	enerator/1axis to 1generator/1				
Manual pulse generator operation	module.		-				
Axis operation status	"Step stopped" is changed to "Sto	pped" and "Step error occurring" is	s changed to "Error occurring".				
	• AD75M□:						
	If the reference axis operates in	reverse direction, the control is in	ternally changed into the				
	continuous positioning control.	(restart after deceleration stop)					
Continuous path control	• QD75M□:						
	Even if the reference axis opera	ates in reverse direction with interp	polation, the control remains as				
	the continuous path control.						
	(In single-axis operation, the op	eration is the same as that of the	AD75M□.)				
Near pass	For the continuous path control, o	nly the near pass function is availa	able.				
	Positioning address pass is not co	onducted.					
2-axis interpolation							
 2-axis linear interpolation 	The interpolation target axis can be	ne randomly set with a positioning	identifier				
2-axis fixed-feed	interpolation target axis can b	to randomly out with a positioning	idonalioi.				
Circular interpolation							
	"Step stopped" is changed to "	Stopped" and "Step error occurring	g" is changed to "Error occurring"				
Step function	in the axis operations status p	arameters.					
Cop (director)	2. The restart command for step	start information (02H) is deleted.					
	3. The step operation is restarted	d with the restart command.					

Changed functions	Change description						
	The command in-position width is expanded.						
Command in-position function	• AD75M□: 1 to 32767000						
	• QD75M□: 1 to 2147483647						
Positioning start No.	7004 to 7010 (block start designa	ation) and 8000 to 8049 (indirect de	esignation) are deleted.				
Disak stort data	With QD75M□, number of blocks has been change to 5 (7000 to 7004).						
Block start data	(With the AD75M□, this data is called "Positioning start information".)						
Ctart history	The configuration of start information and start No. is changed so that the start No. can be directly						
Start history	checked.						
		AD75M□	QD75M□				
Detailed parameters	0	Software stroke limits invalid for	Software stroke limits valid for				
"Pr.15 Software stroke limit valid/	(Factory setting)	manual operation	manual operation				
invalid setting"	1	Software stroke limits valid for	Software stroke limits invalid for				
	1	manual operation	manual operation				

7.5.3 I/O signal comparison to programmable controller CPU

Sequence program change is required as the I/O signals differ.

For details of the I/O signals or sequence program, refer to the Type QD75M Positioning Module User's Manual.

In	out (X)		Outp	Output (Y)					
Signal name	AD75M□	QD75M□	Signal name	AD75M□	QD75M□				
(QD75/AD75) READY*	X00	X00	Axis 1 Positioning start	Y10	Y10				
Axis 1 Start complete	X01	X10	Axis 2 Positioning start	Y11	Y11				
Axis 2 Start complete	X02	X11	Axis 3 Positioning start	Y12	Y12				
Axis 3 Start complete	X03	X12	Axis 4 Positioning start	-	Y13				
Axis 4 Start complete	-	X13	Axis 1 Stop	Y13	Y04				
Axis 1 BUSY	X04	X0C	Axis 2 Stop	Y14	Y05				
Axis 2 BUSY	X05	X0D	Axis 3 Stop	Y1C	Y06				
Axis 3 BUSY	X06	X0E	Axis 4 Stop	-	Y07				
Axis 4 BUSY	-	X0F	All axes servo ON	Y15	Y01				
Axis 1 Positioning complete	X07	X14	Axis 1 Forward run JOG start	Y16	Y08				
Axis 2 Positioning complete	X08	X15	Axis 1 Reverse run JOG start	Y17	Y09				
Axis 3 Positioning complete	X09	X16	Axis 2 Forward run JOG start	Y18	Y0A				
Axis 4 Positioning complete	-	X17	Axis 2 Reverse run JOG start	Y19	Y0B				
Axis 1 Error detection	X0A	X08	Axis 3 Forward run JOG start	Y1A	Y0C				
Axis 2 Error detection	X0B	X09	Axis 3 Reverse run JOG start	Y1B	Y0D				
Axis 3 Error detection	X0C	X0A	Axis 4 Forward run JOG start	-	Y0E				
Axis 4 Error detection	-	X0B	Axis 4 Reverse run JOG start	-	Y0F				
Axis 1 M code ON	X0D	X04	Programmable controller READY	Y1D	Y00				
Axis 2 M code ON	X0E	X05	Axis 1 Execution prohibition flag	-	Y14				
Axis 3 M code ON	X0F	X06	Axis 2 Execution prohibition flag	-	Y15				
Axis 4 M code ON	-	X07	Axis 3 Execution prohibition flag	-	Y16				
Synchronization flag	-	X01	Axis 4 Execution prohibition flag	-	Y17				
Not used	X10 to X1F	X02, X03	Notuced	Y00 to Y0F	Y02, Y03				
Not used	AIUIOAIF	X18 to X1F	Not used	Y1E to Y1F	Y18 to Y1F				

The ON/OFF statuses for READY are different between the QD75M□/ and AD75M□.

	Not READY/WDT error	READY
QD75M□	OFF	ON
AD75M□	ON	OFF

7.5.4 Buffer memory address comparison

Sequence program change is required as the assignment of buffer memory differs. For details of the buffer memory or sequence program, refer to the Type QD75M Positioning Module User's Manual.

area shows the differences between AD75M□ and QD75M□.

	Buffer memory address								
Item of AD75M□		AD75M□		,	QD75M□				
	Axis 1	Axis 2	Axis 3	Axis 1	Axis 2	Axis 3			
Pr.1 Unit setting	0	150	300	0	150	300			
Pr.2 No. of pulses per rotation (AP)	1	151	301	2	152	302			
FI.2 No. of pulses per rotation (Ai)	•		001	3	153	303			
Pr.3 Movement amount per rotation (AL)	2	152	302	4 5	154 155	304 305			
Pr.4 Unit magnification (AM)	3	153	303	1	151	301			
D-7 Speed limit value	6	156	306	10	160	310			
Pr.7 Speed limit value	7	157	307	11	161	311			
Pr.8 Acceleration time 0	8	158	308	12	162	312			
PI.O Acceleration time o	9	159	309	13	163	311			
Pr.9 Deceleration time 0	10	160	310	14	164	314			
	11	161	311	15	165	315			
Pr.10 Bias speed at start	12	162	312	6	156	306			
	13	163	313	7	157	307			
Pr.12 Backlash compensation amount	15	165	315	17	167	317			
Pr.13 Software stroke limit upper limit	16	166	316	18	168	318			
value	17	167	317	19	169	319			
Pr.14 Software stroke limit lower limit	18	168	318	20	170	320			
value	19	169	319	21	171	321			
Pr.15 Software stroke limit selection	20	170	320	22	172	322			
Pr.16 Software stroke limit valid/invalid	21	171	321	23	173	323			
setting									
Pr.17 Command in-position width	22	172	322	24	174	324			
	23	173	323	25	175	325			
Pr.18 Torque limit setting value	24	174	324	26	176	326			
Pr.19 M code ON signal output timing	25	175	325	27	177	327			
Pr.20 Speed switching mode	26	176	326	28	178	328			
Pr.21 Interpolation speed designation method	27	177	327	29	179	329			
Pr.22 Current feed value during speed control	28	178	328	30	180	330			
Pr.23 Manual pulse generator selection	29	179	329	33	-	-			
Pr.25 Size selection for acceleration/ deceleration time	31	181	331	-	-	-			
Function selection for speed-positioning	_	_	_	34	184	334			
	36	186	336	36	186	336			
Pr.26 Acceleration time 1	37	187	337	37	187	337			
	38	188	338	38	188	338			
Pr.27 Acceleration time 2	39	189	339	39	189	339			
D. OO A sealonation time 5	40	190	340	40	190	340			
Pr.28 Acceleration time 3	41	191	341	41	191	341			

	Buffer memory address								
Item of AD75M□		AD75M□			QD75M□				
	Axis 1	Axis 2	Axis 3	Axis 1	Axis 2	Axis 3			
Pr.29 Deceleration time 1	42	192	342	42	192	342			
	43 44	193 194	343 344	43 44	193 194	343 344			
Pr.30 Deceleration time 2	45	195	345	45	195	345			
Dod Dood on the O	46	196	346	46	196	346			
Pr.31 Deceleration time 3	47	197	347	47	197	347			
Pr.32 JOG Speed limit value	48 49	198 199	348 349	48 49	198 199	348 349			
Pr.33 JOG operation acceleration time selection	50	200	350	50	200	350			
Pr.34 JOG operation deceleration time selection	51	201	351	51	201	351			
Pr.35 Acceleration/deceleration process selection	52	202	352	52	202	352			
Pr.36 S-pattern proportion	53	203	353	53	203	353			
Pr.37 Sudden stop deceleration time	54	204	354	54	204	354			
- Sudden stop deceleration time	55	205	355	55	205	355			
Pr.38 Stop group 1 sudden stop selection	56	206	356	56	206	356			
Pr.39 Stop group 2 sudden stop selection	57	207	357	57	207	357			
Pr.40 Stop group 3 sudden stop selection	58	208	358	58	208	358			
Pr.41 Positioning complete signal output time	59	209	359	59	209	359			
Pr.42 Allowable circular interpolation	60	210	360	60	210	360			
error width	61	211	361	61	211	361			
Pr.43 External start function selection									
(QD75M□: Pr.42 External command	62	212	362	62	212	362			
function selection)									
Pr.150 Restart allowable range when	64	214	364	64	214	364			
servo OFF to ON	65	215	365	65	215	365			
Pr.44 Near pass mode selection for path control	66	216	366	-	-	-			
Pr.45 OPR method	70	220	370	70	220	370			
Pr.46 OPR direction	71	221	371	71	221	371			
	72	222	372	72	222	372			
Pr.47 OP address	73	223	373	73	223	373			
Dr 49 OPP speed	74	224	374	74	224	374			
Pr.48 OPR speed	75	225	375	75	225	375			
Pr.49 Creep speed	76 77	226 227	376 377	76 77	226 227	376 377			
Pr.50 OPR retry	78	228	378	78	228	378			
OPR dwell time	-	-	-	79	229	379			
Pr.52 Setting for the movement amount	80	230	380	80	230	380			
after near-point dog ON	81	231	381	81	231	381			
Pr.53 OPR acceleration time selection	82	232	382	82	232	382			
Pr.54 OPR deceleration time selection	83	233	383	83	233	383			
	84	234	384	84	234	384			
Pr.55 OP shift amount	85	235	385	85	235	385			
Pr.56 OPR torque limit value	86	236	386	86	236	386			

	Buffer memory address								
Item of AD75M□		AD75M□			QD75M□				
	Axis 1	Axis 2	Axis 3	Axis 1	Axis 2	Axis 3			
Pr.57 Speed designation during OP shift	88	238	388	88	238	388			
Pr.58 Dwell time during OPR retry	89	239	389	89	239	389			
Pr.59 Absolute position restoration selection	91	241	391	-	-	-			
Pr.100 Servo series	100	250	400	30100	30200	30300			
Pr.101 Amplifier setting	101	251	401	30101	30201	30301			
Pr.102 Regenerative brake resistor	102	252	402	30102	30202	30302			
Pr.103 Motor type	103	253	403	30103	30203	30303			
Pr.104 Motor capacity	104	254	404	30104	30204	30304			
Pr.105 Servo motor speed	105	255	405	30105	30205	30305			
Pr.106 Feed back pulse	106	256	406	30106	30206	30306			
Pr.107 Rotation direction selection	107	257	407	30107	30207	30307			
Pr.108 Auto tuning	108	258	408	30108	30208	30308			
Pr.109 Servo response	109	259	409	30109	30209	30309			
Maker setting	-	-	-	30110	30210	30310			
Maker setting	-	-	-	30111	30211	30311			
Pr.112 Load inertia ratio	112	262	412	30112	30212	30312			
Pr.113 Position loop gain 1	113	263	413	30113	30213	30313			
Pr.114 Speed loop gain 1	114	264	414	30114	30214	30314			
Pr.115 Position loop gain 2	115	265	415	30115	30215	30315			
Pr.116 Speed loop gain 2	116	266	416	30116	30216	30316			
Pr.117 Speed integral compensation	117	267	417	30117	30217	30317			
Pr.118 Notch filter selection	118	268	418	30118	30218	30318			
Pr.119 Feed forward gain	119	269	419	30119	30219	30319			
Pr.120 In-position range	120	270	420	30120	30220	30320			
Pr.121 Electromagnetic brake sequence output	121	271	421	30121	30221	30321			
Pr.122 Analog monitor output	122	272	422	30122	30222	30322			
Pr.123 Optional function 1	123	273	423	30123	30223	30323			
Pr.124 Optional function 2	124	274	424	30124	30224	30324			
Pr.125 Adaptive vibration suppression control/ low pass filter	125	275	425	30125	30225	30325			
Pr.126 Maker setting	-	-	-	30126	30226	30326			
Pr.127 Monitor output 1 offset	127	277	427	30127	30227	30327			
Pr.128 Monitor output 2 offset	128	278	428	30128	30228	30328			
Pr.129 Pre-alarm data selection	129	279	429	30129	30229	30329			
Pr.130 Zero speed	130	280	430	30130	30230	30330			
Pr.131 Error excessive alarm level	131	281	431	30131	30231	30331			
Pr.132 Optional function 5	132	282	432	30132	30232	30332			
Pr.133 Optional function 6	133	283	433	30133	30233	30333			
Pr.134 PI-PID control switch-over position droop	134	284	434	30134	30234	30334			

	Buffer memory address								
Item of AD75M□		AD75M□			QD75M□	S 2 Axis 3 35 30335 36 30336 37 30337 38 30338 - 39 39 30340 41 30341 43 30343 44 30344 45 30345 46 30346 47 30347 48 30348 49 30349 50 30350 51 30351 52 30352 53 30353 54 30354 55 30355 56 30356 57 30357 58 30359 60 30360			
	Axis 1	Axis 2	Axis 3	Axis 1	Axis 2	Axis 3			
Maker setting	-	-	-	30135	30235				
Pr.136 Speed differential compensation	136	286	436	30136	30236	30336			
Pr.137 Maker setting	-	-	-	30137	30237	30337			
Pr.138 Encoder output pulses	138	288	438	30138	30238	30338			
Pr.149 Servo parameter transmission setting	149	299	449	-	-	-			
Maker setting	-	-	-	30139	30239	30339			
Maker setting	-	-	-	30140	30240	30340			
Maker setting	-	-	-	30141	30241	30341			
Slight vibration suppression control selection 1	-	-	-	30143	30243	30343			
Slight vibration suppression control selection 2	-	-	-	30144	30244	30344			
Induction voltage compensation	-	-	-	30145	30245	30345			
Maker setting	-	-	-	30146	30246	30346			
Maker setting	-	-	-	30147	30247	30347			
Maker setting	-	-	-	30148	30248	30348			
Gain changing selection	-	-	-	30149	30249	30349			
Gain changing condition	-	-	-	30150	30250	30350			
Gain changing time constant	-	-	-	30151	30251	30351			
Ratio of load inertia moment to servomotor inertia moment 2	-	-	-	30152	30252	30352			
Position loop gain 2 changing ratio	-	-	-	30153	30253	30353			
Speed loop gain 2 changing ratio	-	-	-	30154	30254	30354			
Speed integral compensation changing ratio	-	-	-	30155	30255	30355			
Maker setting	-	-	-	30156	30256	30356			
Maker setting	_	-	_	30157	30257				
Maker setting	_	-	_	30158	30258				
Maker setting	-	-	-	30159	30259				
Optional function C	-	-	-	30160	30260	30360			
Machine resonance suppression filter	-	-	-	30161	30261	30361			
Maker setting	-	-	-	30162	30262	30362			
Maker setting	-	-	-	30163	30263	30363			
Maker setting	-	-	-	30164	30264	30364			
Maker setting	-	-	-	30165	30265	30365			
Maker setting	-	-	-	30166	30266	30366			

		Buffer memory address						
Item of AD75M□		AD75M□	QD75M□					
		Common for axis 1,2,3	Common for axis 1,2,3,4					
Md.1 In test mode flag		450	1200					
Md.2 Module name		451	-					
Md.3 OS type		452 453 454 455	-					
Md.4 OS version		456 457	-					
Md.5 Clock data (hour: minute)		460	-					
Md.6 Clock data (second: 100 ms)		461	-					
(Pointer number)		(0) to	o (15)					
Md.7 Start axis			40404 400-					
(QD75M□: Md.3 Start information)		462 to 537	1212 to 1287					
Md.8 Operation type		462 to 520	1012 to 1000					
(QD75M□: Md.4 Start No.)	ory .	463 to 538	1213 to 1288					
Md.9 Start Hour: minute	Start history	464 to 539	1214 to 1289					
(QD75M□: Md.5 Start Hour)	Starl	404 (0 339	1214 (0 1209					
Md.10 Start Second: 100 ms		465 to 540	1215 to 1290					
(QD75M□: Md.6 Start Minute: second)		403 (0 340	1213 (0 1290					
Md.11 Error judgment		466 to 541	1216 to 1291					
Md.12 Start history pointer		542	1292					
(Pointer number)		(0) to (15)	-					
Md.13 Start axis	errors	543 to 618	-					
Md.14 Operation type	ing e	544 to 619	-					
Md.15 Start Hour: minute	y dur	545 to 620	-					
Md.16 Start Second: 100 ms	istor	546 to 621	-					
Md.17 Error judgment	Start history during	547 to 622	-					
Md.18 Start history pointer at error	S	623	-					
(Pointer number)		(0) to	o (15)					
Md.19 Axis in which the error occurred		624 to 684	1293 to 1353					
Md.20 Axis error No.		625 to 685	1294 to 1354					
Md.21 Axis error occurrence Hour: minute	tony	626 to 686	1295 to 1355					
(QD75M□: Md.11 Axis error occurrence (Hour))	Error history	020 (0 000	1293 (0 1300					
Md.22 Axis error occurrence Second: 100 ms	Errc							
(QD75M□: Md.12 Axis error occurrence		627 to 687	1296 to 1356					
(Minutes: second))	1							
Md.23 Error history pointer		688	1357					

		Buffer memory address						
Item of AD75M□		AD75M□	QD75M□					
		Common for axis 1,2,3	Common for axis 1,2,3,4					
(Pointer number)		(0) to	(15)					
Md.24 Axis in which the warning occurred		689 to 749	1358 to 1418					
Md.25 Axis warning No.	,	690 to 750	1359 to 1419					
Md.26 Axis warning occurrence Hour: minutes	history	691 to 751	1360 to 1420					
(QD75□: Md.16 Axis warning occurrence (Hour))		09110731	1300 to 1420					
Md.27 Axis warning occurrence Second: 100 ms	Warning							
(QD75M□: Md.17 Axis warning occurrence		692 to 752	1361 to 1421					
(Minutes: second))								
Md.28 Warning history pointer		753	1422					

	Buffer memory address							
Item of AD75M□		AD75M□	Duller Illetti	QD75M□				
	Axis 1	Axis 2	Axis 3	Axis 1	Axis 2	Axis 3		
Md.29 Current feed value	800	900	1000	800	900	1000		
Md.29 Current leed value	801	901	1001	801	901	1001		
Md.30 Machine feed value	802	902	1002	802	902	1002		
	803 804	903 904	1003 1004	803 804	903 904	1003 1004		
Pr.31 Feedrate	805	904	1004	805	904	1004		
Md.32 Valid M code	806	906	1006	808	908	1008		
Md.33 Axis error No.	807	907	1007	806	906	1006		
Md.34 Axis warning No.	808	908	1008	807	907	1007		
Md.35 Axis operation status	809	909	1009	809	909	1009		
Mu.33 Axis operation status				810	910	1010		
Md.36 Current speed	810	910	1010	811	911	1011		
Md.37 Axis feedrate	812	912	1012	812	912	1012		
iwa.57 / wio recurate	813	913	1013	813	913	1013		
Md.38 Speed-position switching control	814	914	1014	814	914	1014		
positioning amount	815	915	1015	815	915	1015		
Md.39 External input/output signal	816	916	1016	816	916	1016		
Md.40 Status	817	917	1017	817	917	1017		
Md.41 Target value	818	918	1018	818	918	1018		
Mu.41 Target Value	819	919	1019	819	919	1019		
Md.42 Target speed	820	920	1020	820	920	1020		
	821 822	921 922	1021 1022	821	921	1021		
Md.43 OP absolute position	823	922	1022	-	-	-		
Md.44 Movement amount after near-point	824	924	1024	824	924	1024		
dog ON	825	925	1025	825	925	1025		
Md.45 Torque limit stored value	826	926	1026	826	926	1026		
Md.46 Special start data instruction code setting value	827	927	1027	827	927	1027		
Md.47 Special start data instruction parameter setting value	828	928	1028	828	928	1028		
Md.48 Start positioning data No. setting value	829	929	1029	829	929	1029		
Md.49 In speed control flag	830	930	1030	830	930	1030		
Md.50 In speed change processing flag	831	931	1031	831	931	1031		
Md.51 Start data pointer being executed	832	932	1032	834	934	1034		
Md.52 Last executed positioning data No.	833	933	1033	837	937	1037		
Md.53 Repetition counter								
(QD75M□: Md.41 Special start repetition	834	934	1034	832	932	1032		
counter)								
Md.54 Positioning data No. being executed	835	935	1035	835	935	1035		
Md.55 Block No. being executed	836	936	1036	836	936	1036		
Md.56 Positioning data being executed	838 to 847	938 to 947	1038 to 1047	838 to 847	938 to 947	1038 to 1047		
MALAGO OPP as travel	848	948	1048	848	948	1048		
Md.100 OPR re-travel value	849	949	1049	849	949	1049		
Md.101 Real current value	850 851	950 951	1050 1051	850 851	950 951	1050 1051		

	Buffer memory address								
Item of AD75M□		AD75M□			QD75M□				
	Axis 1	Axis 2	Axis 3	Axis 1	Axis 2	Axis 3			
Md.102 Deviation counter value	852	952	1052	852	952	1052			
Mid. 102 Beviation dodner value	853	953	1053	853	953	1053			
Md.103 Motor rotation	854 855	954 955	1054 1055	854 855	954 955	1054 1055			
Md.104 Motor current value	856	956	1056	856	956	1056			
Md.105 Auto tuning	857	957	1057	857	957	1057			
Md.106 Load inertia ratio	858	958	1058	858	958	1058			
Md.107 Position loop gain 1	859	959	1059	859	959	1059			
Md.108 Speed loop gain 1	860	960	1060	860	960	1060			
Md.109 Position loop gain 2	861	961	1061	861	961	1061			
Md.110 Speed loop gain 2	862	962	962 1062 862		962	1062			
Pr.111 Speed integral compensation	863	963 1063		863	963	1063			
Md.112 Servo amplifier software No.	864 - 869	964 - 969	1064 - 1069	864 - 869 964 - 969		1064 - 1069			
Md.113 Parameter error (No.0 to 15)	870	970	1070	870	970	1070			
Md.114 Parameter error (No.16 to 31)	871	971	1071	871	971	1071			
Md.115 Parameter error (No.32 to 47)	872	972	1072	872	972	1072			
Parameter error (No.48 to 63)		-		873	973	1073			
Parameter error (No.64 to 75)		-		874	974	1074			
Maker setting		-		875 876	975 976	1075 1076			
Md.116 Servo status	873	973	1077	877	977	1077			
Md.117 Regenerative load ratio	876	976	1078	878	978	1078			
Md.118 Effective load torque	877	977	1079	879	979	1079			
Md.119 Peak torque ratio	878	978	1080	880	980	1080			
Md.121 Absolute position restoration mode	879	979	1079						
Md.120 FeRAM access count	880 - 883	980 - 983	1080 - 1083						
Deceleration start flag		-		899	999	1099			

			Buffer mem	ory address	ry address					
Item of AD75M□		AD75M□			QD75M□					
	Axis 1	Axis 2	Axis 3	Axis 1	Axis 2	Axis 3				
Cd.1 Clock data setting (hour)		1100			-					
Cd.2 Clock data setting (minute, second)		1101			-					
Cd.3 Clock data writing		1102			-					
Cd.4 Target axis		1103			-					
Cd.5 Positioning data No.		1104			-					
Cd.6 Write pattern		1105		-						
Cd.7 Read/write request		1106			-					
Cd.8 Read/write positioning data I/F		1108 to 1137			-					
Cd.9 Flash ROM write request		1138		1900						
Cd.10 Parameter initialization request		1139			1901					
Cd.11 Positioning start No.	1150	1200	1250	1500	1600	1700				
Cd.12 Axis error reset	1151	1201	1251	1502	1602	1702				
Cd.13 Restart command	1152	1202	1252	1503	1603	1703				
Cd.14 M code OFF request	1153	1203	1253	1504	1604	1704				
Cd.15 New current value	1154	1204	1254	1506	1606	1706				
Od. 15 New Current Value	1155	1205	1255	1507	1607 1614	1707				
Cd.16 New speed value	1156 1157	1206 1207	1256 1257	1514 1515	1615	1714 1715				
Cd.17 Speed change request	1158	1208	1258	1516	1616	1716				
Cd.18 Positioning operation speed override	1159	1209	1259	1513	1613	1713				
Cd.19 JOG speed	1160	1210	1260	1518	1618	1718				
	1161	1211	1261	1519	1619	1719				
Cd.20 Speed-position switching enable flag	1163	1213	1263	1528	1628	1728				
Cd.21 Speed-position switching control	1164	1214	1264	1526	1626	1726				
movement amount change register	1165	1215	1265	1527	1627	1727				
Cd.22 Manual pulse generator enable flag	1167	1217	1267	1524	1624	1724				
Cd.23 Manual pulse generator 1 pulse	1168	1218	1268	1522	1622	1722				
input magnification	1169	1219	1269	1523	1623	1723				
Cd.24 OPR return request flag OFF request	1170	1220	1270	1521	1621	1721				
Cd.25 External start valid										
(QD75M□: Cd.8 External command valid)	1171	1221	1271	1505	1605	1705				
Cd.26 Step valid flag	1172	1222	1272	1545	1645	1745				
Cd.27 Step mode	1173	1223	1273	1544	1644	1744				
Cd.28 Step start information	1174	1224	1274	1546	1646	1746				
Cd.29 Skip command	1175	1225	1275	1547	1647	1747				
Cd.30 New torque value	1176	1226	1276	1525	1625	1725				
Cd.31 Positioning starting point No.	1178	1228	1278	1501	1601	1701				
Cd.100 Servo OFF command	1179	1229	1279	1551	1651	1751				
Cd.101 Torque output setting value	1180	1230	1280	1552	1652	1752				

	Buffer memory address								
Item of AD75M□		AD75M□			QD75M□				
	Axis 1 Axis 2 Axis 3		Axis 1	Axis 2	Axis 3				
Cd.32 Interrupt request during	1181	1231	1281	1520	1620	1720			
continuous operation	1101	1231	1201	1320	1020	1720			
	1184	1234	1284	1508	1608	1708			
Cd.33 New acceleration time value	1185	1235	1285	1509	1609	1709			
	1186	1236	1286	1510	1610	1710			
Cd.34 New deceleration time value	1187	1237	1287	1511	1611	1711			
Cd.35 Acceleration/deceleration time									
change during speed change, enable/	1188	1238	1288	1512	1612	1712			
disable selection									
Deceleration start flag valid		-	1		1905				
Stop command processing for deceleration					4007				
stop selection		-			1907				
Servo amplifier data read		-		1553	1653	1753			

				Buffer memory address												
		Item of AD75M□				AD7	5M□	Dun	01 1110111	QD75M□						
				Ax	is 1		is 2	Axi	is 3	Ax	is 1		is 2	Ax	is 3	
	Da. Da.	3 Acceleration time No.			1300 2300 33			00		000		000		000		
				12	201	22	01	22	01	20	101	90	n01	1.41	201	
	Da.	9 M code/condition data		13	801	23	01	33	01	20	01	80	01	140	001	
*_		8 Dwell time/JUMP nation positioning data	No.1	13	302	23	02	3302		20	002	80	02	140	002	
data	Emp	ty		13	803	23	03	33	03	20	03	80	03	140	003	
Positioning data*1	Da.	7 Command speed			804 805		04 05		04 05		04 05		04 05		004 005	
Sitie	Da	5 Positioning address/		13	306	23	06	33	06	20	06	80	06	140	006	
Ā		ement amount		13	807	23	07	33	07	20	07	80	07	140	007	
	Da.	6 Arc address			808 809		08 09		08 09		08 09		08		008	
		No.2		1310 t	o 1319	2310 t	o 2319	3310 t	o 3319	2010 t	o 2019	8010 t	8009 8010 to 8019		14010 to 14019	
		No.3		1320 t	o 1329	2320 t	o 2329	3320 t	o 3329	2020 t	o 2029	8020 t	8020 to 8029		14020 to 14029	
		to		1	to	t	to	t	0	1	to	1	to	to		
		No.100		2290 t	o 2299	3290 t	o 3299	4290 t	o 4299	2990 t	o 2999	8990 t	o 8999		14990 to 14999	
		Da.10 Shape												148	999	
	Start block data*2	Da.11 Start data No. Da.12 Special start instruction Da.13 Parameter	1st point	4300	4350	4550	4600	4800	4850	26000	26050	27000	27050	28000	28050	
	Start	2nd point	•	4301	4351	4551	4601	4801	4851	26001	26051	27001	27051	28001	28051	
	0,	3rd point		4302	4352	4552	4602	4802						28002	·	
_*		to		1	to		to		0		to		0		.0	
ation		50th point		4349	4399	4599	4649	4849	4899	26049	26099	27049	27099	28049	28099	
Positioning start information*3		Da.14 Condition target Da.15 Condition operator		44	100	46	50	49	00	26	100	27	100	28	100	
oning		Da.16 Address	No.1		02 03		52 53		02 03		102 103		102 103		102 103	
Positi	data	Da.17 Parameter 1			04 05		54 55		04 05		104 105		106 107		106 107	
	Condition	Da.18 Parameter 2			106 107		56 57		06 07		106 107		106 107		106 107	
	Ŝ	No.2	1		o 4419	4660 t			o 4919	261	10 to 119	271	10 to 119	281	10 to 119	
		No.3		4420 t	o 4429	4670 t	o 4679	4920 t	o 4929	261	20 to 129	2712	20 to 129	2812	20 to 129	
		to		1	to	1	to	t	0		to		123		:0	
		No.10			o 4499	4740 t			o 4999	261	90 to 199	2719	90 to 199	2819	90 to 199	

^{*1} With the QD75M \square , the positioning data buffer memory addresses are Nos. 1 to 600.

^{*2} With the QD75M□, it is called "block start data".

With the QD75M□, the [block start data] and [condition data] in _____ the area are called [start block 0]. There are five start blocks: 0 to 4

					Buffer mem	ory address				
	Item of	AD75M□		AD75M□						
				Axis 2	Axis 3	Axis 1	Axis 2	Axis 3		
Positioning		Start No.8001	4500	4750	5000	-	-	-		
start	Indirect	Start No.8002	4501	4751	5001	-	-	-		
information	designation	to	to	to	to	to	to	to		
mormation		Start No.8050	4549	4799	5049	-	-	-		
Dragrammal	olo controllor	Condition judgment torget	5050			30000				
Programmal CPU memor		Condition judgment target data of the condition data	to			to				
CFU IIIeIII0I	у агеа	data of the condition data	5099			30099				
Target axis			5100				-			
Head positioning block No.			5101				-			
No. of read/write data items			5102			-				
Read/write request		5103			-					
Read/write b	lock			5110 to 6109			-			

7.5.5 Interface specifications comparison with external devices

For the external interface specifications, the following shows the differences between AD75M \square and QD75M \square .

(1) Comparison of electrical specifications

O : Compatible, \triangle : Partial change required

	ltem	Differences as Interface specifications*	compati- bility	Precautions for replacement
	Upper/lower limit signal	OFF current: 1.5mA→1.0mA	Δ	Check whether the OFF current value met
	Opper/lower limit signal	Input resistance: 4.7kΩ→6.8kΩ		satisfied values
	Stop signal	OFF current: 1.5mA→1.0mA	^	Check whether the OFF current value met
	Stop signal	Input resistance: $4.7k\Omega\rightarrow6.8k\Omega$	Δ	satisfied values
		OFF current: 1.5mA→1.0mA		Check whether the OFF current value met
lanut	Near-point dog signal	Input resistance: $4.7k\Omega\rightarrow6.8k\Omega$	Δ	satisfied values
Input		Response time: 4ms→1ms		satisfied values
		OFF current: 1.5mA→1.0mA		Check whether the OFF current value met
	Speed-position switching signal	Input resistance: $4.7k\Omega\rightarrow6.8k\Omega$	Δ	satisfied values
		Response time: 4ms→1ms		Satisfied values
	Manual pulse generator	ON current: 3.5mA→1.0mA		
	Manual pulse generator	Input resistance: 1.5k→1.2kΩ	0	

^{*} The column of interface specifications differences is described as the form, [Specifications of AD75M□] → [Specifications of QD75M□].

(2) Comparison of connector signal sequence

When using with QD75M□, change the connector and wiring.

	AD7	′5M□	QD75M□		
Name	Logic (Initial setting)	Logic switching by parameter	Logic (Initial setting)	Logic switching by parameter	
Manual pulse generator A phase	Negative logic	Not allowed	Negative logic	Allarmad	
Manual pulse generator B phase*1	(multiple of 4)	Not allowed	(multiple of 4)	Allowed	
Near-Point signal	Negative logic	Not allowed	Negative logic	Allowed	
Stop signal	Negative logic	Not allowed	Negative logic	Allowed	
Upper limit	Negative logic	Not allowed	Negative logic	Allowed	
Lower limit	Negative logic	Not allowed	Negative logic	Allowed	
External start*2	Negative logic	Not allowed	Nogativa logio	Allowed	
Speed-position switching signal*2	Negative logic	Not allowed	Negative logic	Allowed	

^{*1} The following shows comparisons about manual pulse generator A phase/B phase.

	AD75M□	QD75M□
No. of connection	1 generator/axis	1 generator/module
		Allowed
Mode change (Parameter)	Not allowed	1 x mode, 2 x mode,
		4 x mode, PLS/SIGN mode

^{*2} With the QD75M□, the "external start signal" and "speed-position switching signal" are combined into the "external command signal/switching signal".

(3) Supported servo amplifier

(a) For continuous use of a servo amplifier connected with the existing AD75M

The following table shows whether or not the existing servo amplifier can be continuously used with positioning modules replaced.

AD75M□ Supported amplifier model	QD75M□ Availability	Remarks
MR-J□-B	Available	Needs to change the SSCNET cables (refer to (b) in the next page.)
MR-H□-B	Available	Discontinued model
MR-J2□-B	Available	- Discontinueu model
MR-J2S□-B	Available	Needs to change the SSCNET cables (refer to (b) in the next page.)
WIN-023LI-D	Available	Model to be discontinued at the end of September 2015

⊠Point -

(1) Selecting suitable products to replace the existing servo amplifier

When replacing the existing servo amplifier, select a positioning module in the following combinations.

Additionally, the servo motor needs to be replaced.

Positioning module: QD77MS□ + servo amplifier: MR-J3□-B

• Positioning module: QD77MS□ + servo amplifier: MR-J4□-B

(2) Selecting suitable products to replace the existing servo amplifier without servo motor replacement

When replacing the existing servo amplifier alone without servo motor replacement, select a module in the following combination.

Positioning module: QD75M

+ Servo amplifier: MR-J4-B-RJ020

(Conversion Unit for SSCNET of MR-J2S-B Compatible Servo Amplifier)

+ Converter MR-J4-T20

module: (Conversion Unit for SSCNET of MR-J2S-B)

For replacing servo amplifiers and servo motors, data such as positioning parameters and positioning data need to be changed.

When replacing them, contact the department in charge of Mitsubishi electric servo products. For replacing the MR-J2S□-B, refer to "Transition from MELSERVO-J2-Super/J2M Series to J4 Series Handbook" (L(NA)03093).

(b) For SSCNET cables applicable to the servo amplifiers

The following tables show applicable SSCNET cables when the existing servo amplifier is continuously used.

Replacing positioning modules from the AD75M to the QD75M requires the change of SSCNET cables.

Table 1. With the servo amplifier MR-J, J2, or J2S

SSCNET cable		Between QD75 and MR-J/J2/ J2S amplifier	Between AD75 and MR-J/J2/ J2S amplifier	Between MR-J/J2/J2S amplifier and MR-J/J2/J2S amplifier
MR-J2HBUS□M		0	×	0
MR-J2HBUS□M-A		×	0	×
MR-HBUS□M		×	×	×
MR-J2CN1		0	×	0
MR-J2CN1-A	*1	×	0	×
MR-HBCNS		×	×	×

^{*1} Connector set for making the cable by user

Table 2. With the servo amplifier MR-H

SSCNET cable		Between QD75M and MR-H amplifier	Between AD75M and MR-H amplifier	Between MR-H amplifier and MR-H amplifier
MR-J2HBUS□M		×	×	×
MR-J2HBUS□M-A		0	×	×
MR-HBUS□M		×	0	0
MR-J2CN1		×	×	×
MR-J2CN1-A	*1	0	×	×
MR-HBCNS		×	0	0

^{*1} Connector set for making the cable by user

7.6 AD70

7.6.1 Performance specifications comparison

O : Compatible, \triangle : Partial change required, \times : Incompatible

	Madal		O: Compatible, \triangle	. Рапіаі cn	ange required, ×: Incompatible
Item	Model	AD70	QD73A1	Compat- ibility	Precautions for replacement
Number of co	ontrol axes	1 axis	1 axis	0	
D	Capacity	1 data	1 data	0	
Positioning data	Setting method	Sequence program	Sequence program	0	
	Mode	Position control mode (Positioning, two-phase trapezoidal positioning) Speed-position control switch mode	Position control mode (Positioning, two-phase trapezoidal positioning) Speed-position control switch mode	0	
	System	Position control mode: Absolute system/incremental system Speed-position control switch mode: Incremental system	Position control mode: Absolute system/incremental system Speed-position control switch mode: Incremental system	0	
	Position command	-2147483648 to 2147483647 (pulse) (32-bit signed binary)	-2147483648 to 2147483647 (pulse) (32-bit signed binary)	0	
Positioning	Speed command	1 to 400,000 (pulse/s)	1 to 4,000,000 (pulse/s)	0	The specification has improved. (Upward-compatibility)
Positioning	Acceleration/ deceleration	Automatic trapezoidal acceleration/ deceleration	Automatic trapezoidal acceleration/ deceleration	0	
	Automatic acceleration/ deceleration	Acceleration time: 2 to 9999 (ms) Deceleration time: 2 to 9999 (ms)	Acceleration time: 2 to 9999 (ms) Deceleration time: 2 to 9999 (ms)	0	
	In-position range	1 to 2047 pulse	1 to 20479 pulse	0	The specification has improved. (Upward-compatibility)
	Backlash compensation	×	×	0	
	Error correction function	×	×	0	
Speed comm	and output	0 to ±10VDC (Adjustable to set in the range of ±5 to ±10VDC)	0 to ±10VDC (Adjustable to set in the range of ±5 to ±10VDC)	0	
Positioning	Pulse frequency	Open collector : 100kpulse/s TTL: 100kpulse/s Differential output: 100kpulse/s	Open collector: 200kpulse/s TTL: 200kpulse/s Differential output: 1Mpulse/s	0	The specification has improved. (Upward-compatibility)
feedback pulse input	Connectable encoder type	Open collector, TTL, or differential output	Open collector, TTL, or differential output	0	
	Multiplica-tion setting	The number of input feedback pulses can be multiplied by 4, 2, 1, or 1/2.	The number of input feedback pulses can be multiplied by 4, 2, 1, or 1/2.	0	
OPR control		Available (2 method)	Available (2 method)	0	The setting method is changed from a hardware switch to PLC parameter of a CPU module. The function is the same though the setting method is changed.
JOG operation		0	0	0	
Starting time		Absolute system: 4.4ms*1 Incremental system: 4.5ms*1 JOG operation: 4.3ms OPR (near-point dog method): 4.4ms OPR (count method): 5.1ms	Absolute system: 1.2ms*1 Incremental system: 1.2ms*1 JOG operation: 1.2ms OPR (near-point dog method): 1.2ms OPR (count method): 1.2ms	0	The specification has improved. (Upward-compatibility)
M function		×	×	0	
			1	J	1

O : Compatible, \triangle : Partial change required, \times : Incompatible

Model Item	AD70	QD73A1	Compat- ibility	Precautions for replacement
Internal current consumption (5VDC)	5VDC 0.3A	5VDC 0.52A	Δ	The recalculation of internal current consumption (5VDC) is required.
Applicable connector	Refer to Section 7.6.5	Refer to Section 7.6.5	0	The existing external wiring can be used without change.
External supply voltage/ current terminal block	+15VDC, 0.2A -15VDC, 0.02A		0	An external power supply is not required.
Number of occupied I/O points	32 points (Number of I/O slots: 1 slot occupied) (I/O assignment: 32 points, special function module)	48 points (Number of I/O slots: 2 slots occupied) (I/O assignment: First half 16 points, empty slot, Second half 32 points, intelligent function module)	Δ	The number of occupied slots and I/O points are changed.*2
Weight	0.4kg	0.2kg	0	

^{*1} For the AD70, 0.2ms is added to the starting time in two-phase trapezoidal positioning mode. For the QD73A1, an extra time is not added even in two-phase trapezoidal positioning mode.

^{*2} For the QD73A1, the number of occupied slots is 2 and the number of occupied I/O points is 48.

The program can be utilized easily by setting Empty 0 point to the first half slot of the QD73A1, or by setting the XY address of the AD70 to the second half slot of the QD73A1 at Start XY in I/O assignment of PLC parameter.

7.6.2 Function comparison

(1) Function comparison between the AD70 and the QD73A1

○: Compatible, --: Not available

Function			Description	AD70	QD73A1	Precautions for replacement
		Positioning control	Positioning is executed from the current position to a specified position at a specified speed.	0	0	Refer to Section 7.6.6.
	Position control	Two-phase trapezoidal	Positioning is executed to the address specified in "Da.2 Positioning address P1" at "Da.3 Positioning speed V1",			
Major	mode	positioning control	then to the address specified in "Da.4 Positioning address P2" at "Da.5 Positioning speed V2" by one positioning start signal.	0	0	
positioning control	Speed-po	esition vitch mode	Operation starts according to the positioning speed set beforehand by one start signal, then the operation switches to position control by Speed-position switching command signal. If the operation stopped by Stop signal after the input of Speed-position switching command signal, the positioning can be continued by Speed-	0	0	Refer to Section 7.6.6.
			position mode restart signal. In addition, the positioning address (movement amount) can be changed if it is before the input of Speed-position switching command signal.			
JOG operation			Positioning is executed in the specified direction at specified speed while a JOG operation command is on. Turning on the signal starts operation at a specified speed and speed control operation is continued until Stop signal is input.	0	0	
OPR control			A workpiece is returned to an original point following an OPR start command from a CPU module, and the current value is corrected to an OP address after the completion of OPR.	0	0	
Multiplication setting			This function multiplies the feedback pulse frequency from the pulse generator by 4, 2, 1, or 1/2.	0	0	
Electronic gear function		on	This function controls moving distance and speed by multiplying command pulse output.	0	0	
Deviation counter clear function		ar function	This function clears the accumulated pulses in the deviation counter. When the servomotor power is turned off due to an emergency stop during positioning, clearing the accumulated pulses in the deviation counter prevents servomotor rotation at power recovery.	0	0	
Speed change function		n	This function forces to change speed from a program during positioning control or JOG operation.	0	0	Refer to Section 7.6.6.
Current value change function		function	This function changes the current feed value to a specified value from a sequence program on the condition other than while BUSY.	0	0	Refer to Section 7.6.6.
In-position function			This function turns on In-position signal while the accumulated pulse amount in the deviation counter is within the specified in-position range. In-position signal can be used as the signal right before positioning completion.	0	0	
Zero/gain a	djustment		This function adjusts analog voltage contained in accumulated pulses.	0	0	Refer to Section 7.6.6.



Positioning execution time (BUSY signal (X14) ON to Positioning complete signal (X15) ON) of the QD73A1 and AD70 may differ because their internal processing methods are different. As a result, the timing when In-position signal (X16) turns on may also vary.

Adjust positioning execution time using the following methods if the difference of the positioning execution time (or the timing when In-position signal (X16) turns on) affects the system.

- Adjusting the QD73A1's positioning parameter, "Pr.6 Acceleration time" or "Pr.7 Deceleration time".
- Increasing gain by changing the accumulated pulse amount setting through the QD73A1's zero/ gain adjustment

(2) Changed function from the AD70

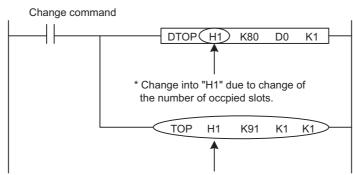
Though the functions of the AD70 and the QD73A1 are same, the setting methods and buffer memory addresses for the functions are partly changed.

To use following functions, changes or corrections of the programs or setting methods are required. For details, refer to the user's manual for the QD73A1.

Changed function	Change description
Major positioning control	Program corrections of the QD73A1 are required because buffer memory addresses for the positioning address, positioning speed, and positioning pattern differ from those of the AD70.
Speed-position control switch mode (speed control operation)	 AD70 For Velocity/position axis travel distance change area, the value is reflected during speed control. Setting value: 0 to 2147483647 (valid within the stroke range) QD73A1 For New speed-position movement amount, the value is cleared to 0 when the next operation starts and reflected when Speed-position switching command signal is turned on. Setting value: 1 to 2147483647 (valid within the stroke range)
Speed change function	 AD70 The speed change is requested by writing a new speed value in Velocity change area of the buffer memory. QD73A1 The speed change is requested by writing a new speed value in the buffer memory and writing "1" to Speed change request (buffer memory address: 91). * To use the speed change function, an additional program is required.*1
Current value change function	 AD70 The current value is changed by writing a new address in Present value change area of the buffer memory. QD73A1 The current value is changed by writing a new address in New current value of the buffer memory and writing "1" to Current value change request (buffer memory address: 90).
Zero/gain adjustment	AD70 The adjustment is performed using the volumes for zero/gain adjustment. QD73A1 The adjustment is performed by either of following methods. 1) Using the UP/DOWN switch for zero/gain adjustment The function is the same as the AD70 though the QD73A1 uses the UP/DOWN switch instead of the volumes. 2) Using the buffer memory To use the buffer memory for the adjustment, create a program.

Changed function	Change description
Mode switch	 AD70 The setting is configured with slide switches or encoder interface setting pin (hardware setting) 1) Slide switches Rotation direction, accumulated pulse, multiplication setting, zero-return direction, zero-return mode, and zero/gain adjustment mode setting/clear 2) Encoder interface setting pin Encoder output types QD73A1 The setting is configured with Switch setting in I/O assignment of PLC parameter (GX Developer). When using GX Works2, set it with the intelligent function module switch setting.) * Though the setting method is changed from a hardware switch to parameters of software, the same level of settings are available because the function is upward compatible.
LED	Refer to *2.

*1 Example of an additional program (using a buffer memory address for the speed change function)



* Create the above due to the speed demand.

*2 Details of LEDs are shown in the table below.

LED name	AD70	QD73A1	Remarks*3	
RUN		RUN		
Minor error	ERR.1	ERR.	Used for both minor errors and major errors.	
Major error	ERR.2	ERR.		
Encoder phase A	φА	φА		
Encoder phase B	φВ	φВ		
Encoder phase Z	φZ	φZ		
BUSY	BUSY	BUSY		
Zero adjustment status		ZERO	The contents indicated with "ZERO" of the QD73A1 differ from the ones indicated with "ZERO" of the AD70.	
Gain adjustment status		GAIN		
Servo READY	SV RDY		Can be checked with an input signal "X1B".	
Near-zero point dog	DOG		Can be checked with an input signal "X1C".	
Stop	STOP		Can be checked with an input signal "X1D".	
Upper limit LS	FLS		Can be checked with an input signal "X1E".	
Lower limit LS	RLS		Can be checked with an input signal "X1F".	
In-Position	IN-POS		Can be checked with an input signal "X16".	
Error counter polarity	POLE		Can be checked with buffer memory addresses "106, 107".	
Error counter value	2 ⁿ		The LED "POLE" of the AD70 indicates ON when the deviation counter value is "-", and indicates OFF when the deviation counter value is "+".	
PC READY	PC RDY		Check the on/off status of an output signal "Y2D" with a device monitor.	
Zero-return request	ZERO		Can be checked with an input signal "X12". The contents indicated with "ZERO" of the AD70 differ from the ones indicated with "ZERO" of the QD73A1.	
Excessive error	EEX		Can be checked with an input signal "X17".	
WDT error	WDT ERR		Can be checked with an input signal "X10".	
During velocity operation	V-MODE		Can be checked with an input signal "X2D".	

*3 The I/O signals shown in the table are the ones when the QD73A1 is mounted on the slots "0, 1" of a main base unit. Note that XY addresses of the QD73A1 are different from the ones of the AD70 because the number of occupied slots differs between the modules as shown below.

AD70					
Power supply module	CPU module	AD70			

QD73A1				
Power supply module	CPU module	QD7	'3A1 	

7.6.3 I/O signals comparison to CPU module

An addition or change of a sequence program is required because the I/O signals partly differ between the modules.

For details of the I/O signals or sequence program, refer to the MELSEC-Q QD73A1 Positioning Module User's Manual.

Input (X)	Output (Y)				
Signal name	AD70	QD73A1	Signal name	AD70	QD73A1
Unused		X00	Unused		Y00
		to			to
(The first half slot is Empty 16 points.)*1		X0F	(The first half slot is Empty 16 points.)*1		Y0F
WDT error, H/W error	X00	X10	Zero/gain adjustment data writing request		Y1A
Module READY	X01	X11	Zero/gain adjustment change request		Y1B
OPR request	X02	X12	Set value change request		Y1C
OPR complete	X03	X13	OPR start	Y10	Y20
BUSY	X04	X14	Absolute positioning start	Y11	Y21
Positioning complete	X05	X15	Forward start	Y12	Y22
In-position	X06	X16	Reverse start	Y13	Y23
Excessive error	X07	X17	Forward JOG start	Y14	Y24
Error detection	X08	X18	Reverse JOG start	Y15	Y25
Overflow	X09	X19	Speed-position mode restart	Y16	Y26
Underflow	X0A	X1A	Stop	Y17	Y27
Servo READY	X0B	X1B	Error reset	Y18	Y28
Near-point dog	X0C	X1C	Overflow reset	Y19	Y29
External stop	X0D	X1D	Underflow reset	Y1A	Y2A
Upper limit signal	X0E	X1E	Speed-position switching enable	Y1C	Y2C
Lower limit signal	X0F	X1F	PLC READY	Y1D	Y2D
OPR start complete		X20		Y00	Y10
About a critical and a complete		V04		to	to
Absolute positioning start complete		X21		Y0F	Y19
Forward start complete				Y1B	Y1D
(for the incremental positioning and the	X22		*2		to
speed-position control switching)			Use prohibited*2	Y1E, Y1F	Y1F
Reverse start complete					
(for the incremental positioning and the		X23			Y2E, Y2F
speed-position control switching)		723			126, 126
speed-position control switching)					
Synchronization flag		X24			<u>'</u>
Zero/gain adjustment data writing complete			1		
flag		X2A			
Zero/gain adjustment change complete flag		X2B	1		
Set value change complete flag		X2C	1		
Operating status of the speed-position			1		
control switch mode		X2D			
Control switch mode					
	X10	X25 to X29			
Use prohibited*2	to	VOE VOE	1		
	X1F	X2E, X2F			

^{*1} The XY number same as the AD70 can be used for the QD73A1 by setting "Empty 0 point" to the "Unused" area of the QD73A1 (first half slot: Empty 16 points) in I/O assignment of PLC parameter.

^{*2} A "Use prohibited" area is reserved for the system use and cannot be used by a user.

If it is turned on/off through a sequence program, the normal operation of the module cannot be guaranteed.

7.6.4 Buffer memory address comparison

Sequence program change is required because the assignment of buffer memory differs between the modules.

For details of the buffer memory or sequence program, refer to the MELSEC-Q QD73A1 Positioning Module User's Manual.

area shows the differences between the AD70 and the QD73A1.

ltem			Buffer memory address		
	item		AD70	QD73A1	
	Stroke limit upper limit		0	0	
Fixed parameter	Stroke littit upper littit		1	1	
	Charles limit lavven limit		2	2	
	Stroke limit lower limit		3	3	
	Nun	nerator of command	4	4	
	puls	e multiplication	4	4	
	Electronic gear Den	ominator of			
	com	mand pulse	5	5	
	mult	tiplication			
	Connect limit value		20	20	
	Speed limit value		21	21	
\/a=i=b a==a==a==	Acceleration time		22	22	
Variable parameter	Deceleration time		23	23	
	In-position range		24	24	
	Positioning mode		25	25	
	OP address		40	40	
	OP address		41	41	
	ODD aread		42	42	
OPR data	OPR speed		43	43	
OFR data	Creep speed		44	44	
	Creep speed		45	45	
	Setting for the movement amo	ount after near-point	46	46	
	dog ON		47	47	
	Positioning pattern		60	301	
	Positioning address P ₁		61	302	
	T ositioning address 1 4		62	303	
	Positioning speed V ₁		63	304	
Positioning data	Tookioning opera 1		64	305	
	Positioning address P ₂		65	306	
	Toolworming address 1 2		66	307	
	Positioning speed V ₂		67	308	
	Transfer of the state of the st		68 80	309	
	New current value	lew current value		80	
	1000 0000 0000 0000		81 82	81	
	New speed value	lew speed value		82	
			83 84	83	
Control change area	JOG speed (area)	speed (area)		84	
			85	85	
	Deviation counter clear comm		86	86	
3	Analog output adjustment area 1		87	87	
	New speed-position moveme	nt amount	88	88	
			89	89	
	Current value change reques	t		90	
	Speed change request			91	
	Analog output adjustment are	ea 2		92	
ů i i			93		

ll		Buffer memory address		
	Item	AD70	QD73A1	
	Zero/gain adjustment specification		94	
Zero/gain adjustment area	Zero/gain adjustment value specification		95	
	Factory default zero/gain adjustment value		96	
	restoration request		96	
	Current feed value	100	100	
	Current leed value	101	101	
	Actual current value	102	102	
	Actual current value	103	103	
	Error code (ERR.1)	104	104	
	Error code (ERR.2)	105	105	
		106	116 ^{*1}	
	Deviation counter value	107	117 ^{*1}	
Monitor area			106 ^{*2}	
Worldor area	Deviation counter value (address)		107 ^{*2}	
	Movement amount after near point dea ON	108	108	
	Movement amount after near-point dog ON	109	109	
	Speed-position switching command	110	110	
	Control mode	111	111	
	Zero/gain execution status		112	
	Zero/gain adjustment status		113	
	Feedrate		114	
	reediate		115	
	(Record 0) Error code		120	
	(Record 0) Error occurrence (Year : Month)		121	
Error history	(Record 0) Error occurrence (Day : Hour)		122	
LITOI HISTOLY	(Record 0) Error occurrence (Minute : Second)		123	
	(Record 1 to 15)		124 to 183	
	Error history pointer		184	

^{*1} A value of the same specification as AD70 is stored. The buffer memory address name of the QD73A1 changes Deviation counter value (pulse). Deviation counter value (pulse) supports the QD73A1 whose serial number (first five digits) is "15042" or later.

^{*2} When electronic gear setting is 1/1, the value will be the same as Deviation counter value (pulse).

7.6.5 Interface specifications comparison with external devices

For the external interface specifications, the following shows the differences between the AD70 and the QD73A1.

O: Compatible, △: Partial change required

				Compati-	Precautions for
It	em	AD70	QD73A1	bility	replacement
External power supply		+15VDC, 0.2A -15VDC, 0.02A		0	An external power supply terminal block is not available because an external power supply is not required.
	CONT.	· ·	ternal wiring (pin type) anufactured by DDK Ltd.) Not included	0	
External wiring connectors	SERVO	· ·	anufactured by DDK Ltd.) Not included	0	The existing external wiring can be used without change.
	Applicable wire size		or less	0	
	Servo READY	0	0	0	
	Stop signal	0	0	0	
	Near-point dog signal	0	0	0	
External input signal	Upper limit signal	0	0	0	
input digital	Lower limit signal	0	0	0	
	Speed- position switching command	0	0	0	
Positioning feedback pulse input		(Pulse frequency) Open collector: 100kpulse/s or less TTL: 100kpulse/s or less Differential: 100kpulse/s or less	(Pulse frequency) Open collector: 200kpulse/s or less TTL: 200kpulse/s or less Differential: 1Mpulse/s or less	0	The specification has improved. (Upward-compatibility)
Servo ON		0	0	0	
Speed comm signal)	and (analog	0	0	0	

7.6.6 Precautions for the replacement of the AD70 by the QD73A1

The following shows precautions for the replacement of the AD70 by the QD73A1.

Item	AD70	QD73A1	Precautions	
Number of occupied slots	1 slot	2 slots	*1	
Number of occupied I/O points	32 points (I/O assignment: Special function module, 32 points)	48 points (I/O assignment: First half slot: Empty 16 points Second half slot: Intelli., 32 points)	*2	
Buffer memory address	Addresses are partly changed. New items are added due to the specification change.		*3	
Mode setting	Hardware switch setting	Parameter setting of a CPU module ("I/O assignment" → "Switch setting")	*4	
LED	 Items indicated with the LEDs differ betw 	veen the AD70 and the QD73A1.	*5	
External wiring	xternal wiring • The existing connectors can be used.		*6*7	
Operation of when Servo READY signal is off	The AD70 counts the feedback pulse, and outputs the voltage proportional to the deviation counter.	The QD73A1 clears the deviation counter to 0, and outputs 0V.	*8	

- *1 Note the following because the number of occupied slots increases for the QD73A1.
 - 1) Check that the base unit has empty slots of 1 slot (or more).

 If the base unit does not have an empty slot, an additional extension base unit is required.
 - 2) The module occupying 2 slots cannot be mounted on the Q series large type base unit.
 Because the same base unit of the existing module is used for the QD73A1, when mounting the QD73A1 on the Q series large type base unit, use 2 base units by adding an extension base unit.
- *2 Configure the I/O assignment setting of parameters in either of following ways so that addresses of the QD73A1 remain the same as the AD70 even after the replacement.
 - 1) Set Empty 0 point to the first half slot.
 - 2) Set the same address of the AD70 to the second half slot of the QD73A1 in the start XY setting.
- *3 Changes or corrections of the programs are required.
 - For details, refer to the MELSEC-Q QD73A1 Positioning Module User's Manual.
- *4 The method of mode setting, which is required for the positioning, is changed from a hardware switch to the switch setting in I/O assignment of PLC parameter.
 - Configure the same setting as the AD70 by referring to the MELSEC-Q QD73A1 Positioning Module User's Manual.
- *5 Items indicated with the LEDs can be checked with I/O signals of the QD73A1.

 If necessary, install lamps corresponding to the LED indications externally and indicate the on/off status of the I/O signals using a program.
- *6 The position where a module is mounted is changed because the dimensions of a base unit of the QD73A1 differ.

 Check whether the wiring is enough even after the replacement because the connector position is changed though the existing connectors can be used without the wiring change.

*7 When the AD70 being used in the setting that the positive voltage is output when the positioning address increases (slide switch 1 (rotation direction setting): on) is replaced with the QD73A1, the cables between the AD70 and an encoder can be used

When the AD70 being used in the setting that the negative voltage is output when the positioning address increases (slide switch 1 (rotation direction setting): off) is replaced with the QD73A1, the wiring change between the AD70 and an encoder is required.

When the AD70 is replaced with the QD73A1 whose serial number (first five digits) is "15042" or later, the cables between the AD70 and the encoder can be used by changing the intelligent function module switch setting.

- <Replacement with the QD73A1 whose serial number (first five digits) is "15041" or earlier>
 - Change the wiring between the AD70 and the encoder so that each phase A and B is reversed.

No.	Slide switch 1 of the AD70 (rotation direction setting)	Rotation direction of the motor and encoder		encoder	Wiring when the AD70 is replaced	to the QD73A1
1	OFF	Same direction	Phase Phase AD70	Phase A Phase B Encoder	Phase A Phase B QD73A1	Phase A Phase B Encoder
2	1011	Reverse direction	Phase Phase B AD70	Phase A Phase B Encoder	Phase Phase B QD73A1	Phase A Phase B Encoder

- <Replacement with the QD73A1 whose serial number (first five digits) is "15042" or later>
 - Set b0 (switch 3) of the intelligent function module switch to 1.
- *8 The operation for the QD73A1 while the signal is off was changed from the operation for the AD70 due to the safety consideration of when Servo READY signal is turned on.

The QD73A1 whose serial number (first five digits) is "15042" or later operates the same as the AD70 by setting b4 (switch 3) of the intelligent function module switch to 1.

8 UPGRADE OF THE POSITION

8.1 A61LS

A61LS, the Mitsubishi position detection modules, is able to upgrade to VARILIMIT. VS-Q62B-V1PG manufactured by our partner "NSD Corporation".

VS-Q62B-V1PG is a built-in converter for Mitsubishi programmable controller Q series.

(1) ABSOCODER sensor cable

The existing cables can be reused. A new wiring is not necessary. I/O cables should be replaced because connectors are different.

The specifications are different between A61LS and VS-Q62B-V1PG, and the extensive modification is necessary in the sequence program and so on. Therefore, please contact your local Mitsubishi representative.

8.2 A62LS-S5 and A63LS

A62LS-S5 and A63LS, the Mitsubishi position detection modules, are able to upgrade to VARILIMIT "VS-Q62" or "VS-Q62B Series" manufactured by our partner "NSD Corporation".

VS-Q62/VS-Q62B Series are a built-in converter for Mitsubishi programmable controller Q series.

(1) Model list of the existing positioning modules, ABSOCODER sensors, and replacement modules

The replacement module "VS-Q62" is selected based on the existing position detection modules and ABSOCODER sensor models with using the below list.

	Replacen	Replacement Q series		Existing A series positioning module		
ABSOCODER sensor	Positioning module Position detection module		Existing A series positioning module			
	VS-Q62	VS-Q62B	A62LS	A62LS-S5	A1S62LS	
MRE-32SP062SAC			0	0	0	
MRE-G□SP062FAC	VS-Q62-M2PG	VS-Q62B-M2PG		0		
(\$\square\$: 64/128/160/256/320)			0	0	0	
VLS-256PWB			0	0	-	
VLS-512PWB			0	0	-	
VLS-1024PW	VS-Q62-L		0	0	-	
VLS-512PYB	V3-Q02-L	-	0	0	-	
VLS-1024PYB			0	0	-	
VLS-2048PY			0	0	-	

VS-Q62: Positioning type with scaling, positioning, and switch output functions

VS-Q62B: Converter type with position detection function

	Replaceme	Existing A series positioning module	
ABSOCODER sensor	Positioning module	Position detection module	- Existing A series positioning module
	VS-Q262	VS-Q262B	A63LS
MRE-32SP062SAC			0
MRE-G□SP062FAC (□: 64/128/160/256/320)	VS-Q262-M2PG	VS-Q262B-M2PG	0

VS-Q262: Positioning type with scaling, positioning, and switch output functions

VS-Q262B: Converter type with position detection function

(2) ABSOCODER sensor cable

The existing cables can be reused. A new wiring is not necessary. I/O cables should be replaced because connectors are different.

(3) Parameter setting software

Please select VS-Q62/Q262-EDW, the parameter setting software for VS-Q62 series.

	VS-Q62	VS-Q62B	A62LS	A62LS-S5	A63LS	A1S62LS
VS-T62	VS-Q62/Q	262-EDW	-	-	0	0
Accessory	(Parameter setting software)		0	0	-	-

Please contact SG Corporation, Overseas division of NSD Group if you need the details of upgrading or VS-Q62 series.

Contact: SG Corporation, Overseas division

Tel: +81 (0) 52 261 2352 Fax: +81 (0) 52 252 0522 E-mail: foreign@nsdcorp.co.jp

APPENDICES

Appendix 1 External Dimensions

For external dimensions of modules shown in this handbook, refer to the user's manual for each module.

Appendix 2 Spare parts storage

(1) The general specifications of programmable controllers are as follows. Please do not store spare parts under a high temperature or high humidity condition, even within the range guaranteed by the specifications.

Storage ambient temperature	-20 to 75°C
Storage ambient humidity	10 to 90%, no condensation

- (2) Store in a place avoiding direct sunlight.
- (3) Store under condition with less dust or no corrosive gas.
- (4) The battery capacity of a A6BAT battery or a lithium-coin battery (commercially available) for memory card will be decreased by its self-discharging even when not used. Replace it with new one in 5 years as a guideline.
- (5) For a power supply module, CPU module with built-in power supply, or analog module that use any aluminum electrolytic capacitor, which is indicated in the table below, take the following measures since the characteristics will be deteriorated when the aluminum electrolytic capacitor is left un-energized for a long time.

Product	Model
CPU module	A1NCPU, A1NCPUP21, A1NCPUR21, A1NCPUP21-S3, A2CCPU,
	A2CCPUP21, A2CCPUR21, A2CCPUC24, A2CCPUC24-PRF,
(Power supply built-in type)	A2CJCPU-S3
Davier averaly madella	A61P, A61PEU, A61P-UL, A62P, A62PEU, A63P, A68P, A61RP,
Power supply module	A67RP, A2CJ66P
Analog module	A62DA, A62DA-S1

[Countermeasures for preventing aluminum electrolytic capacitor characteristics deterioration]

Apply the rated voltage to the aluminum electrolytic capacitor for several hours once a year to activate it. Or, rotate products at the periodic inspection (in every 1 year or two).

[Reference]

The life of an aluminum electrolytic capacitor, even if not used, under a normal temperature decreases approximately at 1/4 speed of the case when it is energized.

Appendix 3 Related Manuals

Appendix 3.1 Replacement Handbooks

(1) Transition Guide

No.	Manual Name	Manual Number	Model Code
1	MELSEC-A/QnA Series Transition Guide	L(NA)08077E	_

(2) Transition from MELSEC-A/QnA (large type) to Q series handbook

No.	Manual Name	Manual Number	Model Code
1	Transition from MELSEC-A/QnA (Large Type) Series to Q Series	L-08043ENG	_
	Handbook (Fundamentals)	L-00043ENG	_
2	Transition from MELSEC-A/QnA (Large Type) Series to Q Series	L-08046ENG	
	Handbook (Intelligent Function Modules)	L-00040ENG	_
3	Transition from MELSEC-A/QnA (Large Type) Series to Q Series	L-08048ENG	
3	Handbook (Network Modules)	L-00046ENG	_
4	Transition from MELSEC-A/QnA (Large Type) Series to Q Series	L-08050ENG	
4	Handbook (Communications)	L-00030ENG	_
5	Transition from MELSEC-A0J2H Series to Q Series Handbook	L-08060ENG	_
6	Transition from MELSECNET/MINI-S3, A2C(I/O) to CC-Link Handbook	L-08061ENG	_
7	Transition from MELSEC-I/OLINK to CC-Link/LT Handbook	L-08062ENG	_
'	Transition from MELSEC-I/OLINK to AnyWire DB A20 Handbook	L08263ENG	
8	Transition of CPUs in MELSEC Redundant System Handbook	L-08117ENG	_
0	(Transition from Q4ARCPU to QnPRHCPU)	L-00117 LING	

(3) Transition Examples

No.	Manual Name	Manual Number	Model Code
1	MELSEC-A/QnA (Large), AnS/QnAS (Small) Transition Examples	L(NA)08121E	_

(4) Others

No.	Manual Name (TECHNICAL BULLETIN)	Manual Number	Model Code
1	Procedures for Replacing Positioning Module AD71 with QD75	FA-A-0060	
2	Precautions for replacing A/QnA (large type) series CPU with Universal	FA-A-0068	_
	model QCPU	1 A-A-0000	

Appendix 3.2 A/QnA series

No.	Manual name	Manual number	Model code
1	MELSEC-QnA/A Catalog	L-174-0-C5177	_
2	MELSEC-QnAS/AnS Catalog	L-174-0-C5266	_
3	Analog-Digital Converter Module Type A68AD User's Manual	IB-64572	13J305
4	Analog-Digital Converter Module Type A68AD-S2 User's Manual	IB-68102	13J349
5	Analog-Digital Converter Module Type A68ADN User's Manual	IB-68219	13JA33
6	Analog-Digital Converter Module Type A616AD User's Manual	IB-68078	13J361
7	Digital-Analog Converter Module Type A62DA User's Manual	IB-64573	13J306
8	Digital-Analog Converter Module Type A62DA-S1 User's Manual	IB-68074	13J350
9	Digital-Analog Converter Module Type A68DAV/A68DAI(S1) User's	IB-68273	13JA35
9	Manual	10-00273	133733
10	Digital-Analog Converter Module Type A616DAV User's Manual	IB-68079	13J362
11	Digital-Analog Converter Module Type A616DAI User's Manual	IB-68080	13J363
12	Pt100 Input Module Type A68RD3N/4N, A1S62RD3N/4N User's Manual SH-0		13JT69
13	Temperature-Digital Converter Module Type A616TD User's Manual IB-68104		13J368
14	High-Speed Counter Module Type AD61(AD61S1) User's Manual IB-64576		13J307
15	Positioning Module Type AD70 User's Manual IB-68106		13J356
16	Positioning Module Type AD72 User's Manual IB-68008		13J333
17	Positioning Module Type A1SD75P1-S3/P2-S3/P3-S3	SH-3608	13JH86
17	AD75P1-S3/P2-S3/P3-S3 User's Manual	SH-3000	
18	Positioning Module Type A1SD75M1/M2/M3	ID 00745	12 11105
18	AD75M1/M2/M3 User's Manual	IB-66715	13JH85
19	GX Configurator-AP Version 1 Operating Manual	IB-80031	13JN44

Appendix 3.3 Q series

No.	Manual name	Manual number	Model code	
1	MELSEC-Q Catalog	L-08033E	-	
2	MELSEC-Q Data Book	L-08029E	_	
3	Analog-Digital Converter Module User's Manual	SH-080055	13JR03	
4	Channel Isolated High Resolution Analog-Digital Converter Module (With	SH-080277	13JR51	
	Signal Conditioning Function) User's Manual	SH-000211		
5	Digital-Analog Converter Module User's Manual	SH-080054	13JR02	
6	Channel Isolated Digital-Analog Converter Module User's Manual SH-080281			
7	Channel Isolated Analog-Digital Converter Module (With Signal	SH-080647ENG	13JR96	
1	Conditioning Function) User's Manual	SH-000047 ENG		
8	Channel Isolated Thermocouple Input Module User's Manual	SH-080795ENG	13JZ26	
9	Thermocouple Input Module Channel Isolated Thermocouple/Micro	SH-080141	13JR30	
Э	Voltage Input Module User's Manual	311-000141		
10	RTD Input Module Channel Isolated RTD Input Module User's Manual SH-080142		13JR31	
11	High-Speed Counter Module User's Manual	SH-080036	13JL95	
12	High-Speed Counter Module QD62-H01, QD62-H02 User's Manual	IB-0800421	13JY78	
13	Type QD75P/QD75D Positioning Module User's Manual	SH-080058	13JR09	
14	Type QD75M Positioning Module User's Manual	IB-0300062	1CT752	
15	GX Configurator-QP Version 2 Operating Manual	SH-080172	13JU19	
16	QD73A1 Positioning Module User's Manual	SH-081075ENG	13JZ69	

Appendix 3.4 Programming tool

No.	Manual name	Manual number	Model code
1	GX Developer Version 8 Operating Manual	SH-080373E	13JU41

Appendix 4 How to Change Resolution After Analog I/O Module is Replaced

This section describes how to change the resolution of an analog I/O module after the module is replaced from A series to Q series.

(1) Resolution of A series and Q series analog I/O modules

Each A series analog I/O module have different resolutions. Please check the resolution of the module in this handbook or user's manual.

If the resolution differs between A series and Q series modules, it needs to be matched by a user (by creating a sequence program or changing user range settings).

		0.10000.0.1	- qu	ou. o o o qu o u b , u o o .
		Resolution of Q seri	es analog I/O module	9
Resolution of A series	Normal resolution	High resolution mode		Hoor rongo
analog I/O module	mode	Current	Voltage	User range
	1/4000	1/12000	1/16000	(Voltage: 1/12000)
1/4000	0	-	-	-
1/8000	△*1	△*1	△*1	_
1/12000	_	0	_	*2

O: Measure required by user, △: Measure not required by user

(2) Example of sequence program to change a resolution

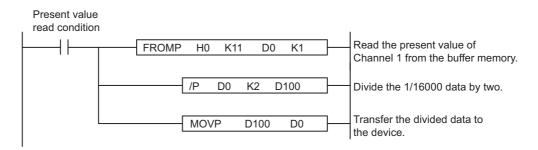
(Condition)

(a) Resolution of an A series analog I/O module: 1/8000

(b) Device that stores a present value read from the analog I/O module: D0

(c) Device that is used for resolution change operation: D100, D101

* Two-/four-word data is used in the four arithmetic operations instruction. Use unused device areas so that existing device data are not affected by this operation.



^{*1} Change the resolution in a sequence program. (Refer to Appendix 4 (2).)

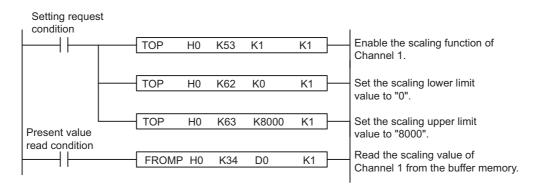
^{*2} Set a user range in high resolution mode.

(3) Using the scaling function (for example in the Q68AD-G) to change a resolution

If the module after replacement (for example, the Q68AD-G) supports the scaling function^{*1}, a resolution can be changed using this function. (Condition)

- (a) Resolution of an A series analog I/O module: 1/8000 (Only one channel is used.)
- (b) Q series analog I/O module: Q68AD-G

(Example of sequence program to set the function and read the scaling value)



(Buffer memory areas of the Q68AD-G)

Address		Description	Default	Read/Write
Hexadecimal	Decimal	Description	Delault	ixeau/vviite
35 _H	53	Scaling enable/disable setting	00FF _H	R/W
36 _H	54	CH1 Scaling value	0	
37 _H	55	CH2 Scaling value	0	
38 _H	56	CH3 Scaling value	0	
39 _H	57	CH4 Scaling value	0	R
3A _H	58	CH5 Scaling value	0	K
3B _H	59	CH6 Scaling value	0	
3C _H	60	CH7 Scaling value	0	
3D _H	61	CH8 Scaling value	0	
3E _H	62	CH1 Scaling lower limit value	0	
3F _H	63	CH1 Scaling upper limit value	0	R/W
40 _H	64	CH2 Scaling lower limit value	0	FX/VV
41 _H	65	CH2 Scaling upper limit value		

^{*1} For details of the scaling function, refer to the user's manual for the module used.

WARRANTY

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

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.

However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.

Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

- (1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.
- (2) Even within the gratis warranty term, repairs shall be charged for in the following cases.
 - 1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
 - 2. Failure caused by unapproved modifications, etc., to the product by the user.
 - 3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
 - 4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
 - 5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
 - 6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
 - 7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

- Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued.
 - Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.
- (2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.



Mitsubishi Programmable Controller

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Mitsubishi Electric Corporation Nagoya Works is a factory certified for ISO 14001 (standards for environmental management systems) and ISO 9001(standards for quality assurance management systems)





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