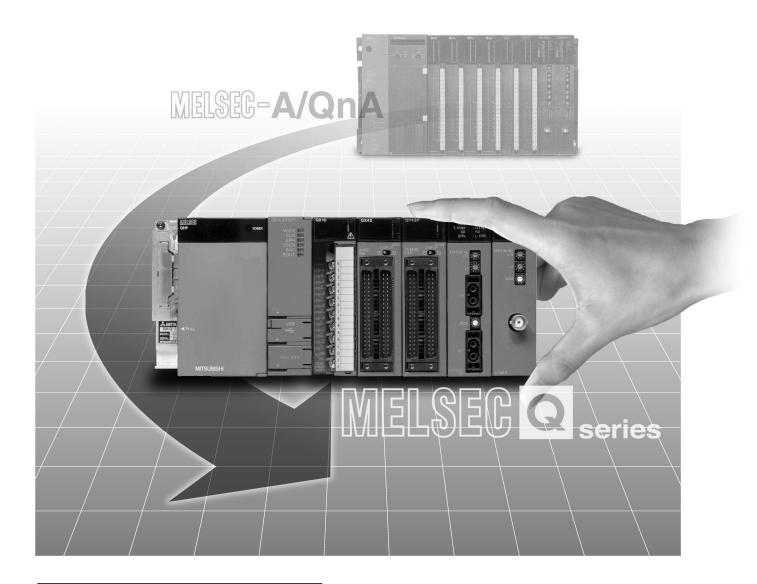
MITSUBISHI

Mitsubishi Programmable Controller

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

(Intelligent Function Modules)



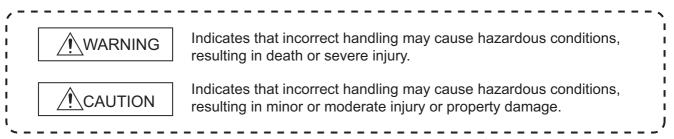
Jun. 2013 Edition

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: "MARNING" and "CAUTION".



Under some circumstances, failure to observe the precautions given under "<u>CAUTION</u>" 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]

WARNING • 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 Output OFF Output OFF protection equipment. (b) The CPU module self-diagnosis functions, such Hold or turn off all output as the watchdog timer error, detect problems. according to the parameter Output OFF setting. 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
l	n an output module, when a load current exceeding the rated current or an overcurrent caused by a
10	oad short-circuit flows for a long time, it may cause smoke and fire. To prevent this, configure an
e	external safety circuit, such as a fuse.
C	Configure a circuit so that the programmable controller is turned on first and then the external power
S	supply.
	f the external power supply is turned on first, an accident may occur due to an incorrect output or nalfunction.
	For the operating status of each station after a communication failure, refer to relevant manuals for
	each network.
F	Failure to do so may result in an accident due to an incorrect output or malfunction.
V	When changing data of the running programmable controller from a peripheral connected to the
C	CPU module or from a personal computer connected to an intelligent function module or special
	unction 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
	he 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
	ailure.
Т	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
fa	ailure.
Г	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.
F	Failure to do so may result in malfunction due to noise.
۷	When a device such as a lamp, heater, or solenoid valve is controlled through an output module, a
lä	arge current (approximately ten times greater than normal) may flow when the output is turned from
С	off to on.
_	Take measures such as replacing the module with one having a sufficient current rating.
1	
	After the CPU module is powered on or is reset, the time taken to enter the RUN status varies
A	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

[Installation Precautions]

 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]

- 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.

 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 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]

• 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.

 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]

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]

 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
Oct., 2005	L(NA)-08046ENG-B	Addition
		Appendix 1
		Partial correction
		Contents, Appendix 1 \rightarrow 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 \rightarrow Q68DAVN, Q68DAI \rightarrow 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,
		Section 9.1.4, Appendix 2.1 to Appendix 2.3
Jul., 2011	L(NA)-08046ENG-D	Model addition
		Q68AD-G, Q68TD-G-H02
		Partial addition
		CONDITIONS OF USE FOR THE PRODUCT, Section 2.4, Section 2.6,
		Section 2.8
		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,
		Chapter 9, Appendix 2.1, Appendix 2.3
		Partial deletion
		Chapter 9 (External dimensions)
Mar., 2013	L(NA)-08046ENG-E	Model addition
		QD73A1
		Model change
		Addition
		Section 7.6
		Partial correction
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		Section 6.1, Section 6.3.4, Section 7.1, Section 7.2, Section 7.4

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

Japanese Handbook Version L-08045-H

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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.

2 ANALOG INPUT MODULE REPLACEMENT

2.1 List of Analog Input Module Alternative Models for Replacement

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

2 ANALOG INPUT MODULE REPLACEMENT

Production disco	ontinuation		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: Input signals (Either V or I input) and increase in current consumption 5) Function specifications: Not changed				
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: Conversion speed ((20ms/channel) → sampling cycle (10ms/channel) + response speed (20ms)) 5) Function specifications: Changed (Non-insulation → insulation between channels) 				

*1 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 renewal tool (conversion adaptor) manufactured by Mitsubishi Electric Engineering Co., Ltd.

Product	MELSEC-A/QnA series module	MELSEC-Q series module	Conversion adaptor		
	A68AD	Q68ADV			
	AUSAD	Q68ADI	ERNT-AQT68AD		
		Q68ADV	ERNT-AQT66AD		
Analog input module	A68AD-S2	Q68ADI			
		Q68ADV			
	A68ADN	Q68ADI	ERNT-AQT68ADN		

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

lt	em				A616AD			
	Voltage		-10 to		Input resistance	value: 1MΩ)		
Analog input	Current		-20 to 0	to +20mADC	(Input resistance	value: 250Ω)		
Digital output	1			(-48 to 404	inary (Data part: 47, -2048 to 2047 bled for each cha	')		
			Input	Analog input range	Maximum resolution	Digital output value		
I/O characteris	tics		Voltage (V)	0 to +10 0 to +5 +1 to +5 -10 to +10 -5 to +5	2.5mV (1/4000) 1.25mV (1/4000) 1.0mV (1/4000) 5.0mV (1/4000) 2.5mV (1/4000)	0 to 4000 -2000 to 2000		
maximum reso				0 to +20 0 to +20	10μA (1/2000) 5μA (1/4000)	0 to 2000 -2000 to 0 0 to 4000		
			Current (mA)	+4 to +20 -20 to +20	4μA (1/4000) 20μA (1/2000)	-2000 to 2000 1000 to 3000 -1000 to 1000		
				-20 to +20	10µA (1/4000)	0 to 4000 -2000 to 2000		
Overall accura	су	When using A616AD -5V to 5V, -20 to 20m 0 to 5V, 1 to 5V 0 to 20mA, 4 to 20m/	A	}	Range: ±0.3% (Digital value ±12 Range: ±0.6% (Digital value ±24			
			When using combination with any of A60MX, A60MXR, A60MXRN, the accuracy of each range of A616AD is $\pm 0.3\%$ (Digital output value ± 12).					

○ : Compatible A : Partial change required x: Incompatible

						O:0	Compatible, \triangle : Part	ial change required, ×: Incompatible
	Q68AD	V		(Q68ADI		Compatibility	Precautions for replacement
	-10 to 10\	/DC						
(Inpu	t resistance v	/alue: 1MΩ)			-			The voltage/current cannot be
				0 to	o 20mADC			mixed for one module.
	-			(Input resist	ance value:	250Ω)		
		16-bit (Normal resolution olution mode: -1		4096 to 4095	-		Δ	A616AD can set the data format to [-2048 to 2047]. However, Q68ADV/I cannot set. When using the conversion data of Q68ADV/I in [-2048 to 2047], convert with sequence program.
Analo	g input	Normal reso			ligh resolution			
	ige	Digital	Maximu			Maximum		
	-	output value	resolutio			resolution		When using A616AD in [-5 to +
	0 to 10V		2.5mV			0.625mV		5V] range, Q68ADV can obtain
	0 to 5V	0 to 4000	1.25m\	0 to 1	2000	0.416mV 0.333mV		equivalent resolution or more
Voltage	1 to 5V		1.0mV					than A616AD by setting in [-10
	-10 to 10V User range	-4000 to 4000	2.5mV 0.375m ¹			0.625mV 0.333mV	Δ	to 10V] range/high resolution
	settings					1.00.1		mode or user range.
	0 to 20mA	0 to 4000	5µA	0 to 1	2000	1.66µA		When using A616AD in [-20 to
Current	4 to 20mA		4µA			1.33µA		+20mA] range, use Q68ADI in
	User range settings	-4000 to 4000	1.37µA	-12000 t	to 12000	1.33µA		user range.
		ormal resolution mo	ode	•	n resolution mo	ode		
		t temperature to 55°C		Ambient temperature 0 to 55°C				
Analog inpu	i With	Without	Ambient	With	Without	Ambient		
range	temperatu		temperature	temperature	temperature	temperature		
	drift	drift	25±5°C	drift	drift	25±5°C		
	compensat	ion compensation		compensation	compensation	n		
0 to 1	V			. 0. 00/	.0.40/	.0.494		
-10 t	D			±0.3%	±0.4%	±0.1% (±16 digits)		A616AD is the accuracy in
10V				(±48 digits)	(±64 digits)	(±10 digits)		respect to the full scale, and
Voltage 0 to 5	V						0	Q68ADV/I is the accuracy in
1 to 5	V							respect to maximum digital
Use	r							output value.
rang	±0.3%	±0.4%	±0.1%					
settin	gs (±12 digits		(±4 digits)	0.554				
0 to		_ /	- /	±0.3%	±0.4%	±0.1%		
20m				(±36 digits)	(±48 digits)	(±12 digits)		
4 to								
Current 20m								
Use								
rang settin								
seum	90				ļ			

Item	A616AD	
	When using only A616AD: 1	
	When using a combination with A60MX: 1	
	When using a combination with A60MXR:	
	1 (Sampling processing time),	
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]	
Absolute maximum input	Voltage: ±15V	
Abooluto maximum inp at	Current: ±30mA	
Analog input points	16 channels/module	
Maximum number of writes for	<u> </u>	
E ² PROM		
	Between the input terminal and programmable controller: photocoupler isolation	
Isolation method	Between the input terminal and programmable controller: photocoupler isolation Between channels: non-isolated (1M Ω resistor isolation)	
Isolation method		
Isolation method Dielectric withstand voltage		
Dielectric withstand voltage	Between channels: non-isolated (1MΩ resistor isolation)	
Dielectric withstand voltage	Between channels: non-isolated (1MΩ resistor isolation) 32 points	
Dielectric withstand voltage Insulation resistance Occupied I/O points	Between channels: non-isolated (1MΩ resistor isolation) 32 points (I/O assignment: special 32 points)	
Dielectric withstand voltage	Between channels: non-isolated (1MΩ resistor isolation) 32 points (I/O assignment: special 32 points) 38-point terminal block	
Dielectric withstand voltage Insulation resistance Occupied I/O points	Between channels: non-isolated (1MΩ resistor isolation) 32 points (I/O assignment: special 32 points) 38-point terminal block 0.75 to 2mm ²	
Dielectric withstand voltage Insulation resistance Occupied I/O points Connected terminal Applicable wire size	Between channels: non-isolated (1MΩ resistor isolation) 32 points (I/O assignment: special 32 points) 38-point terminal block	
Dielectric withstand voltage Insulation resistance Occupied I/O points Connected terminal Applicable wire size Applicable solderless	Between channels: non-isolated (1MΩ resistor isolation) 32 points (I/O assignment: special 32 points) 38-point terminal block 0.75 to 2mm ²	
Dielectric withstand voltage Insulation resistance Occupied I/O points Connected terminal Applicable wire size Applicable solderless terminal	Between channels: non-isolated (1MΩ resistor isolation) - - 32 points (I/O assignment: special 32 points) 38-point terminal block 0.75 to 2mm² (Applicable tightening torque: 39 to 59N•cm)	
Dielectric withstand voltage Insulation resistance Occupied I/O points Connected terminal Applicable wire size Applicable solderless terminal Internal current consumption	Between channels: non-isolated (1MΩ resistor isolation) - - 32 points (I/O assignment: special 32 points) 38-point terminal block 0.75 to 2mm² (Applicable tightening torque: 39 to 59N•cm)	
Dielectric withstand voltage Insulation resistance Occupied I/O points Connected terminal Applicable wire size Applicable solderless terminal	Between channels: non-isolated (1MΩ resistor isolation) - 32 points (I/O assignment: special 32 points) 38-point terminal block 0.75 to 2mm² (Applicable tightening torque: 39 to 59N•cm) V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	

2 ANALOG INPUT MODULE REPLACEMENT

_	0684.DV	Q68ADI	O : Compatible, Compatibility	△ : Partial change required, ×: Incompatible
	Q68ADV 80μs/channel (When there is temperature adding 160μs will be used regardles	drift compensation, the time calculated by	Compatibility	Precautions for replacement 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	ler isolation	0	
	Between the I/O terminal and prog 500VAC, fo		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.
		minal block	×	
	0.3 to 0.	×	Wiring change is required.	
	R1.25-3 (A solderless terminal	×		
	0.64A	0.64A	0	
	0.19kg	0.19kg	0	

2.2.2 Function comparison

Item	Description	A616AD	Q68ADV/I	O : With functions, -: Without functions 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) × 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.

Order Signal name Device Signal name No. Signal name Not used Not used Not used Ya Not used Ya Not used Ya Not used		A61	6AD		Q68ADV/I				
No. No. No. Mo. X0 Watchdog timer error Y0 X1 A/D conversion READY Y1 X2 Error flag Y2 X3 Y3 X4 Y4 X5 Y6 X6 Y6 X7 Y7 X8 Y6 Y9 Y8 Y9 Y8 Y9 Y8 Y8 Y8 Y9 Y8 Y8 Y8 Y9 Y8 X4 Y6 X6 Y7 X8 Y8 Y9 Y9 X4 Y4 X5 Y6 X6 Y7 X8 Y8 Y9 Y9 X4 Y4 X6 Y6 X6 Y6 X6 Y6 X7 Y1 X8 Y8 Y9 Y2 X6 Y6 X6 Y6 X6 Y6 X7 Y1 X8 Y8 Y0 RFRP, RTOP instruction for interlock signal when A616AD is used in request	Device	Signal name	Device	Signal name	Device	Signal name	Device	Cignel neme	
X1 A/D conversion READY Y1 X2 Error flag Y2 X3 Y3 X4 Y4 X5 Y6 X6 Y6 Y7 Not used X8 Y8 Y9 Y9 XA YA Y8 Y8 Y9 Y9 XA YA XA YA XA YA XA YA Y8 Y8 Y9 Y9 XA YA XA YB	No.	Signal name	No.	Signal name	No.	Signal name	No.	Signal name	
X1 X10 Conversion REAUY Y1 X2 Error flag Y2 X3 Y3 X4 Y3 X4 Y4 X5 Y5 X6 Y6 X7 Y7 X8 Y3 Y9 Y8 Y9 Y9 XA Y3 XA Y4 X8 Y8 Y9 Y8 Y9 Y0 XA Y4 XA Y4 XA Y4 X9 Operating condition setting mode status flag Y9 XA YA Y8 Y0 RFRP.RTOP instruction for interlock signal when request for interlock signal when remote I/O station XC X10 Y11 Y11 Y111 Y112 Y13 X118 Y18 Y18 X12 Y19 Y18 X13 Y18 Y18 X14 Y14 Y14 Y11 Y12 Y14 <td< td=""><td>X0</td><td>Watchdog timer error</td><td>Y0</td><td></td><td>X0</td><td></td><td>Y0</td><td></td></td<>	X0	Watchdog timer error	Y0		X0		Y0		
X2 Error flag Y2 X3 Y3 X4 Y4 X5 Y6 X6 Y6 Y7 Y8 Y8 Y8 Y9 Y8 Y9 Y9 XA YA Y8 Y8 Y9 Y8 Y9 Y8 Y9 Y8 Y9 Y8 Y0 RFRP, RTOP instruction for interlock signal when X11 Y10 Y11 X10 Y11 X11 Y11 X118 Y13 X10 Y11 X118 Y13 X10 X11 X118 Y13 X10 X11 X118 Y13 X10 Y11 X118 Y13 X10 Y11 X118 Y13 X10 Y11 X118 Y13 X10 Y12 X118 Y13 X10 Y14 X118 Y14 X10 Y15 X10 Y16 X10 Y16 X110 Y112 X110 <t< td=""><td>X1</td><td>A/D conversion READY</td><td>Y1</td><td></td><td>X1</td><td></td><td>Y1</td><td></td></t<>	X1	A/D conversion READY	Y1		X1		Y1		
X3 Y3 Y3 X4 Y4 X5 Y6 X7 Y8 Y9 Y7 X8 Y8 Y9 Y9 XA YA Y8 Y9 YA Y8 Y9 Y9 XA YA Y8 Y9 YA YA Y8 Y9 YA YA Y8 Y9 YA YA Y8 Y9 YA YA YB YB YC YC YD RFRP, RTOP instruction for interlock signal when A616AD is used in remote I/O station XF Y10 X11 Y11 X12 Y13 X14 Y15 X16 Y16 X17 Y18 X18 Y18 X10 RFRP, RTOP instruction for interlock signal when A616AD is used in remote I/O station Y10 Y11 Y11 Y12 Y10 Y11 X11 Y12 Y18 Y16 X10 RFRP, RTOP instruction Y16 X110 Y18 Y18						compensation flag			
X4 X4 X4 X4 X4 X5 Not used Y4 Y5 X6 X7 Y8 Y6 Y6 Y6 Y6 X8 Y9 Y8 Y8 Y8 Y8 X9 Y9 Y8 Y9 Operating condition setting completed flag Y9 XA YA YA YA Offsetyain setting mode flag YB XA YB YC XC Not used XC XD Y0 RFRP, RTOP instruction for interlock signal when A616AD is used in remote I/O station XD Maximum value/ completed flag YB X10 XF YF Not used XF Error flag YF Error clear request X11 Y12 Y13 Not used XF Error flag YF Error clear request X11 Y14 Y15 Y16 Y16 Y16 Y16 Y16 Y16 X10 X11 Y18 Direct access request signal Y16 Y16 Y16 Y16 X10 RFRP, RTOP instruction Y10 Y16 Y16 Y16 Y16 Y16 X11 Y18 Y18 Y18 Y16 Y16 Y16 Y16 <t< td=""><td></td><td>Error flag</td><td></td><td></td><td></td><td></td><td></td><td></td></t<>		Error flag							
XS YS YS X6 YS X7 YR Y8 YR Y9 Y8 Y9 Y9 YA YA Y8 Y9 Y9 Y9 Y8 YA Y8 YA Y9 Y9 YA YA YA YA YB RFRP, RTOP instruction for interlock signal when achifor interlock signal when ach			-					No.4	
X6 X7 X8 Y6 X7 Y8 Y9 Y8 Y9 Y9 XA YA YA YA YB YA YA YA YB YA YB YA YA YA YB YA YB YA YA YA YB YB YB RFRP, RTOP instruction for interlock signal when remote I/O station YE A616AD is used in remote I/O station YE YA Y10 Y11 Y11 Y12 Y13 Y16 <						Not used		Not used	
X7 X8 Y7 Not used Y7 X8 High resolution mode status flag Y8 X9 Y9 Operating condition setting completed flag Y9 XA YA Y8 YA YA Operating condition setting completed flag Y9 XB YA YB X4 User range write request XB YC XC Not used YA User range write request XD YC XC Not used YC Not used XE YD RFRP, RTOP instruction for interlock signal when A616AD is used in remote I/O station XE Maximum value/ minimum value reset completed flag YB X10 Y10 Y11 Y12 Not used XF Error flag YF Not used X11 Y11 Y12 Y13 Not used YF Error clear request X11 Y13 Y14 Not used YF Error flag YF Error clear request X11 Y13 Y14 Not used YF It of interlock signal when request YF It of interlock signal when request YF Not used X11 Y10 Y11 Y12 Not used YF It of interlock signal when request <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>		-							
X8 Y8 Not used Y8 X9 Y9 Operating condition mode status flag Y8 XA YA YA Operating condition setting request XA YA YA VA Operating condition setting request XB YA YB Offset/gain setting mode flag YA User range write request XC YD RFRP, RTOP instruction for interlock signal when for interlock signal when remote I/O station XD Maximum value/ Maximum value/ X10 YF Af16AD is used in remote I/O station XF Error flag YF Not used X11 Y12 Y13 Not used XF Error flag YF Error clear request X11 Y12 Y13 Not used XF Error flag YF Error clear request X11 Y12 Y13 Not used XF Error flag YF Error clear request X11 Y14 Y14 Y14 Not used YF Error flag YF Error clear request X12 Y13 Not used Y16 Y16 Y16 Y16 Y16 Y16 X15 Y16 Y16 Y16 Y16 Y16 Y16 Y16 <									
X8 Y8 X8 status flag Y8 X9 Y9 Operating completed flag Y9 Operating completed flag XA YA YA XA Offset/gain setting mode flag YA XB YB YC XA Offset/gain setting mode flag YA User range write request completed flag XC YC YC XC Not used YC Not used XD YD RFRP, RTOP instruction for interlock signal when Af16AD is used in remote I/O station XE Maximum value/ Maximum value/ XF Y10 Af16AD is used in remote I/O station XF Error flag YF Not used X11 Y12 Y13 Not used YF Error flag YF Error clear request X11 Y11 Y12 Y13 Not used YF Irror clear request X11 Y11 Y12 Y13 Not used YF Irror clear request signal X11 Y13 Y14 Y14 Y15 YF Irror clear request signal X11 Y14 Y15 Y16 Y16 Y17 Y16 X12 Y13 Y14 Y16 Y16 Y16 Y16 X11		-		Not used		High resolution mode			
X9 Y9 XA YA XA YA XB YA YA YA YA YA YA YA YB YA YB YB YC XA Offset/gain setting mode flag YA VB YC XD YC XD YC YD RFRP, RTOP instruction for interlock signal when remote I/O station XE YF YF Y10 Y11 X11 Y12 X13 Y13 X14 Y16 X17 Y17 X18 Y18 X11 Y12 X12 Y13 X14 Y14 Y15 Direct access request signal X16 Y16 X17 Y17 X18 Y16 X10 Y16 X11 Y12 X12 Y13 X13 Y14 Y14 Y15 X16 Y16 X17 Y16 X18 Y16 X10 RFRP, RTOP instruction Y11 X11 Y12	X8		Y8		X8	-	Y8		
X0 Y9 Y9 XA YA XA YA YB YA YB YA YB YA YB YA YB YB YC XA YB YB YC XA YB YB YC XA YD RFRP, RTOP instruction for interlock signal when remote I/O station XE YE X10 YF X11 Y11 X12 Y12 Y13 Not used Y11 Y12 Y12 Y13 Y14 Y14 Y15 Y16 Y17 Not used X18 Y18 Y19 Direct access request signal X11 Y18 Y18 Y18 Y19 Y18 Y10 Y18 Y11 Y18 Y12 Y18 X14 Y11 X18 Y18 X10 Y16 X11 Y18 Y12 Y18 Y13 Y16 Y14 Y16 Y18 Y16						-		Operating condition	
XA YA YA YA User range write request XB YB YB Channel change completed flag YB Channel change request XD YC YC XC Not used YC Not used XD YD RFRP, RTOP instruction for interlock signal when reduces in reduc	X9		Y9		X9		Y9		
XB YB YB XB Channel change Completed flag YB Channel change completed flag XD YC YC XC Not used YC Not used XD YD RFRP, RTOP instruction for interlock signal when remote I/O station XD Maximum value/ minimum value reset completed flag YD Maximum value/ minimum value reset request Maximum value/ minimum value reset completed flag YE Not used XF YF Af16AD is used in remote I/O station XE A/D conversion completed flag YE Not used X10 Y10 Y11 Y11 Y11 XE Not used X11 Y12 Y13 Not used XF Error flag YF Error clear request X11 Y14 Y14 Y14 Y14 Y14 Y14 X18 Y18 Direct access request signal Not used YI X11 Y11 Y14 Y14 Y14 X18 Y18 Y16 Y10 Not used X10 RFRP, RTOP instruction for interlock signal when Y1E Y10 Not used X11 Y18 Y16 Y16 X10 RFRP, RTOP instruction for interlock signal when Y1E Y10	VA		VA		× 4	Offset/gain setting mode	VA	Lloor rongo write request	
XB YB XB completed flag YB Channel change request XC YC XC Not used YC Not used XD YD RFRP, RTOP instruction for interlock signal when A616AD is used in remote I/O station Maximum value/ Maximum value reset completed flag Maximum value/ minimum value reset request XE YE A616AD is used in remote I/O station XE A/D conversion completed flag YE Not used X11 Y11 Y12 Y11 Y11 YE Fror clear request X11 Y11 Y12 Not used XF Error flag YF Error clear request X11 Y11 Y12 Not used YF Error clear request YF X13 Y13 Y14 Y15 Not used YF Error flag YF X18 Y18 Direct access request signal Y18 Direct access request signal Y18 Not used X110 RFRP, RTOP instruction X11 Y11 Y14 Y16 Not used X110 RFRP, RTOP instruction Y110 Y11 Not used Y16 X110 RFRP, RTOP instruction Y116 Y116 Y16 Y16 X110 RFRP, RTOP instruction for interlock signal when Y1E <td>74</td> <td></td> <td>IA</td> <td></td> <td>~~~</td> <td>flag</td> <td>IA</td> <td>User range while request</td>	74		IA		~~~	flag	IA	User range while request	
XC YC XC Not used YC Not used XD YD RFRP, RTOP instruction for interlock signal when A616AD is used in remote I/O station Maximum value/ Maximum value reset completed flag Maximum value/ minimum value reset request XE YE A616AD is used in remote I/O station XE A/D conversion completed flag YE Not used X10 Y1 Y10 YF Fror flag YE Not used X11 Y12 Y13 Not used XF Error flag YF Error clear request X11 Y13 Y13 Not used YF Information of the request in the reset in the request YF Information of the request X11 Y12 Y13 Not used YF Information of the request in the request YF Information of the request X13 Y14 Y13 Not used YF Information of the request in the request YF X18 Y18 Direct access request signal Y10 Not used YF Information of the request in the	XB		YB		XB	Channel change	YB	Channel change request	
XD YD RFRP, RTOP instruction for interlock signal when A616AD is used in remote I/O station XD Maximum value/ minimum value reset completed flag Maximum value/ minimum value reset request XE YE A616AD is used in remote I/O station XE A/D conversion completed flag YE Not used X11 Y11 Y11 Y11 YE Not used XF Error flag YF Error clear request X11 Y11 Y12 Y13 Not used YF Error clear request YF X11 Y14 Y15 Y16 Y17 Direct access request signal YF Fror clear request X18 Y19 Y14 Y18 Direct access request signal Not used X10 RFRP, RTOP instruction Tor interlock signal when Af6AD is used in remote I/O signal when Af6AD is used in remote I/O signal when Aff6AD is used in remote I/O signal									
XD YD RFRP, RTOP instruction for interlock signal when A616AD is used in remote I/O station XD minimum value reset completed flag YD minimum value reset request XE A616AD is used in remote I/O station XE A/D conversion completed flag YE Not used X10 Y10 YF YF Fror clear request YF Error clear request X11 Y112 Y13 Not used Y14 Y15 Y16 X11 Y14 Y16 Y16 Y17 VI10 X18 Y18 Direct access request signal Signal VI VI X11 Y18 Direct access request signal Not used VI VI X10 RFRP, RTOP instruction X10 Y10 Not used VI VI X11 Y18 Y16 VI Not used VI X11 Y18 Y10 Not used VI VI X11 Y116 Y10 Not used VI VI X11 Y116 Y10 Not used VI VI X11 Y116 Y10 Not used VI VI X12 Signal when Y16 VI VI VI X12	XC		YC		XC		YC		
XE Not used YE for interlock signal when remote I/O station XE A/D conversion completed flag YE Not used XI0 YF YF YF YF Not used X10 Y10 Y11 Y11 YF YF Fror clear request X11 Y11 Y11 Y12 Y13 YF Fror clear request X11 Y11 Y11 Y11 YF Fror clear request X11 Y11 Y11 Y13 Not used YF Fror clear request X11 Y11 Y11 Y13 Not used YF Fror clear request X13 Y14 Y13 Not used YF Fror clear request X16 Y16 Y17 Not used YF YF X18 Y18 Direct access request signal YF YF X19 Y14 Y18 Not used YF YF X10 RFRP, RTOP instruction Y10 YF Not used X10 RFRP, RTOP instruction Y10 Not used YF X11 for interlock signal when Y1E Not used YF							=		
XE YE A616AD is used in remote I/O station XE A/D conversion completed flag YE Not used X10 YF YF YF Error flag YF Error clear request X11 Y12 Y13 Y14 Y15 Y17 Not used X18 Y16 Y17 Direct access request signal Y18 Direct access request signal X19 Y10 Y14 Y18 Y17 X18 Y19 Y10 Y10 Y16 X19 Y10 Y10 Y10 X10 Y11 Y12 Y13 X11 Y17 Direct access request signal Y18 X19 Y10 Y10 Y10 X10 RFRP, RTOP instruction Y10 X11 Y11 Y11 X12 Y13	XD		YD		XD		YD		
XE YE remote I/O station XE completed flag YE Not used XF Y10 Y10 Y10 YF Error flag YF Error clear request X11 Y11 Y12 Y12 Y13 Not used YF Error clear request X11 Y12 Y13 Y14 Y14 Y14 Y15 Y16 YF X16 Y16 Y17 Y17 Y18 Direct access request signal YF YF YF X18 Y18 Y19 Y14 Y14 Y14 YF YF YF X18 Y19 Y14 Y14 YF YF YF YF X10 RFRP, RTOP instruction Y10 YF YF YF YF X10 RFRP, RTOP instruction Y10 YF YF YF YF X10 RFRP, RTOP instruction Y10 YF YF YF YF X10 RFRP, RTOP instruction Y10 YF YF YF YF X11 YF YF YF YF YF YF YF X11 YF YF YF YF YF YF YF </td <td></td> <td>Not used</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>request</td>		Not used						request	
XF XF XF Error flag YF Error clear request X10 Y11 Y12 Y13 Y11 Y12 X13 Y13 Y13 Y14 Y15 X16 Y16 Y16 Y17 X18 Y18 Direct access request signal X19 Y14 Y18 X10 Y11 X11 Y11 X12 Y13 X14 Y16 X17 Y18 X18 Y18 X19 Y18 Y11 Y11 Y18 Direct access request signal X10 Y10 X11 Y11 X11 Y11 X11 Y11 X11 Y11 X11 Y11 X18 Y19 X10 RFRP, RTOP instruction X11 Y10 Y10 Y10	XE		YE		XE		YE	Not used	
X10 Y10 X11 Y11 X12 Y11 X13 Y11 X14 Y13 X15 Y16 X16 Y16 X17 Y17 X18 Y18 X19 Y19 X11 Y11 X11 Y11 X11 Y17 X18 Y18 X19 Y14 X11 Y11 Y12 Y12 Y13 Y12 Y14 Y12	XF		YF		XF		YF	Error clear request	
X11Y11X12Y11X13Y12X13Y13X14Y14X15Y15X16Y16X17Y17X18Y18X19Y18X19Y18X10Y10X11RFRP, RTOP instructionX11Y10X12Y11X11Y11		-							
X12 Y12 X13 Y13 X14 Y14 X15 Y15 X16 Y16 X17 Y17 X18 Y18 X19 Y18 X10 Y11 X11 Y11 X11 Y18 Direct access request signal X19 Y11 X1A Y11 X1B Y11 X1D RFRP, RTOP instruction X11 Y10 X12 Y10 X14 Y11									
X14 Y14 X15 Y15 X16 Y16 X17 Y17 X18 Y18 X19 Y19 X1A Y18 Y18 Y19 X18 Y18 X19 Y14 X18 Y18 X19 Y14 X10 Y18 Y11 Y18 Y11 Y11 X11 For interlock signal when X11 For interlock signal when X11 For interlock signal when X11 Y11									
X14 Y14 X15 Y15 X16 Y16 X17 Y17 X18 Y18 X19 Y19 X1A Y18 X1B Y18 X1B Y11 X1B Y11 X1D RFRP, RTOP instruction X11 Y11 X12 Y11 X14 Y11 X15 Y11	X13		Y13	Netwood					
X16 Y16 X17 Y17 X18 Y18 X19 Y18 X19 Y19 X1A Y1A X1B Y1B X1C Y1C X1D RFRP, RTOP instruction X1E for interlock signal when Y1E Y1E	X14]	Y14	not used					
X17 Y17 X18 Y18 Direct access request signal X19 Y19 X1A Y19 X1A Y1A X1B Y1B X1C Y1C X1D RFRP, RTOP instruction X1E for interlock signal when Y1E Y1E									
X18 Y18 Direct access request signal X19 Y19 X1A Y19 X1A Y1A X1B Y1B X1C Y1C X1D RFRP, RTOP instruction X1E for interlock signal when X1E for interlock signal when Y1E A616AD is used in									
X18 Y18 signal X19 Y19 X1A Y1A X1B Y1B X1C Y1C X1D RFRP, RTOP instruction Y1D Y1E A616AD is used in Y1E	X17	ļ	Y17	D					
X19 Y19 X1A Y1A X1B Y1B X1C Y1C X1D RFRP, RTOP instruction Y1D Y1E A616AD is used in Y1E	X18		Y18	•					
X1A Y1A X1B Y1B X1C Y1C X1D RFRP, RTOP instruction Y1D Y1E X1E for interlock signal when Y1E A616AD is used in	¥10			signal					
X1B Y1B X1C Y1C X1D RFRP, RTOP instruction Y1D X1E for interlock signal when Y1E A616AD is used in V1E		-							
X1C Y1C X1D RFRP, RTOP instruction Y1D X1E for interlock signal when Y1E		1							
X1D RFRP, RTOP instruction Y1D X1E for interlock signal when Y1E		1							
X1E for interlock signal when Y1E		RFRP, RTOP instruction		Not used					
A616AD is used in									
	VAE	-							
X1F remote I/O station Y1F	XIF	remote I/O station	ΥIF						

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	For eller f	INPUT designation	D 444	0	A/D conversion enable/disable	
1	For direct	MX. CH. designation	R/W	1	CH1 Time/count averaging setting	
2	access	Digital output value	R	2	CH2 Time/count averaging setting	
3	Sampling period designation			3	CH3 Time/count averaging setting	-
4	Data format sel	ection	-	4	CH4 Time/count averaging setting	
5	Error code stor	age	R/W	5	CH5 Time/count averaging setting	R/W
6	Faulty multiples	er module CNT. No. storage	-	6	CH6 Time/count averaging setting	
7				7	CH7 Time/count averaging setting	
8				8	CH8 Time/count averaging setting	
9				9	Averaging processing specification	
10				10	A/D conversion completed flag	
11	System area (N	lot used)	-	11	CH1 Digital output value	
12				12	CH2 Digital output value	-
13				13	CH3 Digital output value	-
14				14	CH4 Digital output value	-
15		A616AD		15	CH5 Digital output value	-
16		INPUT 0 A60MX, A60MXR		16	CH6 Digital output value	R
17		INPUT 1 A60MX, A60MXR	-	17	CH7 Digital output value	-
18	Conversion	INPUT 2 A60MX, A60MXR	-	18	CH8 Digital output value	
19		INPUT 3 A60MX, A60MXR	-	19	Error code	-
20	designation	INPUT 4 A60MX, A60MXR	R/W	20	Setting range (CH1 to CH4)	
21	g	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	-	23	Offset/gain setting mode Gain specification	R/W
24	Set data setting		-	24		
25) · · · · · · · · ·		25		
26	•			26		
27	•			27	System area (Not used)	-
28	•			28		
29	•			29		
30				30	CH1 Maximum value	
31	1			31	CH1 Minimum value	1
32	1			32	CH2 Maximum value	1
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		,		36	CH4 Maximum value	1
37	1			37	CH4 Minimum value	
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
40	1			44	CH8 Maximum value	1
45				45	CH8 Minimum value	4

2 ANALOG INPUT MODULE REPLACEMENT

MELSEC

Address Name Read/write Address Name Read/write 46 System area (Not used) - 48 - 48 16 INPUT channel digital output value R 10 - - 167 64 - 64 - - 167 168 - 64 - - 167 169 - 64 - - 169 169 - - - - 169 160 - - - - 203 204 - - - - 204 CH1 Industrial shipment settings offset value - - 205 206 CH2 Industrial shipment settings offset value - 206 CH3 Industrial shipment settings offset value 206 - 207 208 CH4 Industrial shipment settings offset value 206 208 209 - - - 209 204 - - - 211 212 CH5 Industrial shipment settings offset value 213 212 CH6 Industrial shipment settings offset value 214 - 216 217 C		A616AD			Q68ADV/I	
Ubic: Otoes 46 47 47 46 47 48 10 NPUT channel digital output value R 63 NPUT channel digital output value R 63 64 63 64 63 64 10 157 158 158 159 Mode switching setting RVW 199 160 10 10 10 201 201 201 201 201 201 202 203 CH1 Industrial shipment settings offset value 204 205 CH2 Industrial shipment settings gain value 204 205 CH2 Industrial shipment settings gain value 206 CH4 Industrial shipment settings gain value 206 CH4 Industrial shipment settings offset value 206 CH4 Industrial shipment settings offset value 206 CH4 Industrial shipment settings offset value 206 CH4 Industrial shipment settings offset value 205 CH2 Industrial shipment settings offset value 212 CH6 Industrial shipment se	Address		Deed/wwite	Address		Deed/wite
47 System area (Not used) - 47 48 NPUT channel digital output value R 48 5 63 NPUT channel digital output value R 64 66 64 66 64 66 64 66 157 158 157 157 158 160 0 5 5 5 7 201 201 201 201 201 202 CH1 Industrial shipment settings offset value 203 204 622 CH2 Industrial shipment settings offset value 206 643 Industrial shipment settings offset value 206 644 Industrial shipment settings offset value 206 643 Industrial shipment settings offset value 207 CH3 Industrial shipment settings offset value 211 CH5 Industrial shipment settings offset value 212 212 212 213 CH6 Industrial shipment settings offset value 213	(Dec.)	Name	Read/write	(Dec.)	Name	Read/write
47 47 48 INPUT channel digital output value R 63 64 66 63 64 157 158 64 10 157 158 Mode switching setting R/W 159 157 158 Mode switching setting R/W 150 157 158 Mode switching setting R/W 201	46	System area (Not used)		46		
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10 157 158 159 150 159 160 157 159 160 160 157 159 160 160 0 201 202 203 203 204 204 205 202 206 203 207 202 208 204 209 204 201 205 202 204 205 202 206 CH3 Industrial shipment settings offset value 206 CH3 Industrial shipment settings offset value 207 CH3 Industrial shipment settings offset value 208 CH4 Industrial shipment settings offset value 210 210 211 CH5 Industrial shipment settings offset value 212 213 214 CH7 Industrial shipment settings offset value 215 System area (Not used) - 216 CH8 Industrial shipment settings offset value 217 CH8 Industrial shipment settings offset value 218 CH4 Industrial shipment settings offset value 219 CH1 User range settings offset value 2210 C	63			63		
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211 212 213 214211CH5 Industrial shipment settings gain value 212 213 214 214CH6 Industrial shipment settings offset value 213 214 214 214CH7 Industrial shipment settings gain value 215 216 216 216 217 218 219 219 220 220 221 221 222 222 222 222 222 223 223 224 225 226 227 226 227 228 226 227 228 229 230 231 231 231 232 233 233 234 to MX. CH. channel digital output valueRRWR						-
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218218CH1 User range settings offset value2192202202212212202222212222212232222242242252252262272272282292292302302312312322322332332341010255256MX. CH. channel digital output valueR					· •	-
219220221221222222223224224225226227228229230231231232231232231232231232233234toMX. CH. channel digital output valueR						R/W
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221222223224224224225226227228229230231232232233234toMX. CH. channel digital output valueR						-
222 223 224224 225 226 227 228 229 230 230 231 231 231 232 232 233 234 to231 232 233 234 to234 to40 MX. CH. channel digital output valueR					o o	-
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224225226227228229230231232232233234toMX. CH. channel digital output valueR						-
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to 255 256 to MX. CH. channel digital output value		4		200	one oser range settings gallt value	I
255 256 to MX. CH. channel digital output value R		1				
256 to MX. CH. channel digital output value R		1				
to MX. CH. channel digital output value R						
		MX CH channel digital output value	R			

2.3 A68AD (Upgrade to Q68ADV, Q68ADI)

2.3.1 Performance comparison

li	tem	A68AD -10 to 0 to +10VDC	4					
	Voltage	(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)						
		Analog input Digital output						
		+10V +2000						
I/O characteris	STICS	+5V or +20mA +1000 0V or +4mA ±0						
		0V or +4mA ±0 -5V or -12mA -1000						
		-10V -2000						
		Voltage: 5mV (1/2000)						
Maximum reso	olution	Current: 20µA (1/1000)						
			_					
	acy (Accuracy in							
respect to max	ximum digital	±1% (±20)						
output value)								
Maximum con	version speed	Max. 2.5ms/channel						
		Voltage: ±15V						
Absolute maxi	imum input	current: ±30mA						

	Q68AD	V			Q68ADI	0.		tial change required, ×: Incompatible Precautions for replacement	
	-10 to 10				-				
(Input resistance value: 1MΩ)				-				The voltage/current cannot be	
-					o 20mAD(mixed for one module.	
		16-bi	t signed bin	(Input resis	lance vail	ue. 250(2)			
		(Normal resolut	-	-	5		0		
	High res	solution mode: -					Ŭ		
	<u> </u>			- ,	,				
Anala	a innut	Normal reso	olution mode	H	ligh resoluti	ion mode		As concept of gain value is	
	g input nge	Digital	Maximur	-	jital	Maximum		changed, refer to [Analog-	
	-	output value	resolutio	· · ·	t value	resolution	Δ	Digital Converter Module	
	0 to 10V 0 to 5V	0 to 4000	2.5mV 1.25mV		6000	0.625mV 0.416mV		User's Manual] and then,	
	1 to 5V		1.0mV	0 to 1	2000 -	0.333mV		confirm the I/O characteristics.	
Voltage	-10 to 10V		2.5mV	-16000	to 16000	0.625mV			
	User range	-4000 to 4000	0.375m	/ -12000	to 12000	0.333mV			
	settings 0 to 20mA					1.66µA			
	4 to 20mA	0 to 4000	5μA 4μA	0 to 1	2000 —	1.66µA 1.33µA	0		
Current	User range	-4000 to 4000		12000	12000		-		
	settings	-4000 10 4000	1.37µA	-12000	to 12000	1.33µA			
	Normal resolution mode			High resolution mode					
Ambient temperature 0 to				Ambient temperature 0 to					
Analog inpu	ut	55°C	Ambient		5°C Withou	Ambient			
range		Without ure temperature	temperature	With With temperature temper		temperature			
	drift	drift	25±5°C	drift	drift	25±5°C			
		tion compensation	1	compensation	compensa	ation			
0 to 1 -10				±0.3%	±0.4%	±0.1%			
10				(±48 digits)	(±64 digi	its) (±16 digits)			
Voltage 0 to	5V						0		
1 to									
use									
rang settir	±0.3%		±0.1%						
0 t		ts) (±16 digits)	(±4 digits)	±0.3%	±0.4%				
20m				(±36 digits)	(±48 digi	its) (±12 digits)			
4 to Current 20m									
use									
rang									
settir	ngs								
								The conversion speed of	
								Q68ADV/I to A68AD has	
								become quick. And then, on	
)µs/channel					A68AD, the noise that did not	
(When there		ure drift compens			-	ng 160 µs will b		import on Q68ADV/I can be	
	use	d regardless of t	he number	of channels i	used.)			imported as analog signal. In	
								this case, use the averaging processing function to remove	
								the effect of noise.	
	±15V	/			±30mA		0		
1									

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	

2 ANALOG INPUT MODULE REPLACEMENT

		O: Compatible	, \triangle : Partial change required, ×: Incompatible
Q68ADV	Q68ADI	Compatibility	Precautions for replacement
8 channe	ls/module	0	
Max. 100,	000 times	0	
Between the I/O terminal and prog photocoupl Between channe	ler isolation	0	
Between the I/O terminal and prog 500VAC, fo		0	
Between the I/O terminal and prog 500VDC, 20	rammable controller power supply: $M\Omega$ or more	0	
•	oints ntelligent 16 points)	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	l 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

Item	Description	A68AD	Q68ADV/I	O : With functions, -: Without functions 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 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.

	A68	BAD			Q68/	ADV/I	
Device	Signal name	Device	Signal name	Device	Signal name	Device	Signal name
No.	Signal name	No.	Signal hame	No.	Signar name	No.	Signal name
X0	Watchdog timer error	Y0		X0	Module READY	Y0	
X1	A/D conversion READY	Y1		X1	Temperature drift	Y1	
					compensation flag		
X2		Y2		X2		Y2	
X3 X4		Y3 Y4		X3 X4		Y3 Y4	Not used
×4 X5		Y5		X5	Not used	Y5	Not used
X6		Y6		X6		Y6	
X7		Y7		X7		Y7	
					High resolution mode		
X8		Y8		X8	status flag	Y8	
VO		240		XO	Operating condition	Y9	Operating condition
X9		Y9		X9	setting completed flag	19	setting request
ХА		YA		ХА	Offset/gain setting mode	YA	User range write request
77				774	flag	17	User range while request
ХВ		YB		ХВ	Channel change	YB	Channel change request
					completed flag		
XC		YC		XC	Not used	YC	Not used
VD		VD		VD	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	Not used	YE		XE	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		Y17					
X18		Y18					
X19 X1A		Y19 Y1A					
X1A X1B		Y1A Y1B					
X1D X1C		Y1C					
X1D		Y1D					
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 (Dec.)	Name	Read/write	Address (Dec.)	Name	Read/write						
0	Number of channels		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		4	CH4 Time/count averaging setting	5.44						
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	-						
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)							
21			21	Setting range (CH5 to CH8)	-						
22			22	Offset/gain setting mode Offset specification	5.44						
23			23	Offset/gain setting mode Gain specification	R/W						
24			24								
25									25		
26	System area (Not used)	-	26		-						
27			27	System area (Not used)							
28			28								
29			29								
30			30	CH1 Maximum value							
31	1		31	CH1 Minimum value	1						
32	1		32	CH2 Maximum value	1						
33	1		33	CH2 Minimum value	1						
34	Write data error code	R/W	34	CH3 Maximum value	1						
			35	CH3 Minimum value	1						
			36	CH4 Maximum value							
			37	CH4 Minimum value							
			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						
			45	CH8 Minimum value	1						

	Q68ADV/I	
Address	Name	Read/write
(Dec.)	Name	Reau/write
46		
to	System area (Not used)	-
157		
158	Modo switching sotting	R/W
159	Mode switching setting	FV/ V V
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 44/
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	1
222	CH3 User range settings offset value	1
223	CH3 User range settings gain value	1
224	CH4 User range settings offset value	1
225	CH4 User range settings gain value	
226	CH5 User range settings offset value	1
227	CH5 User range settings gain value	
228	CH6 User range settings offset value	1
229	CH6 User range settings gain value	
230	CH7 User range settings offset value	1
231	CH7 User range settings gain value	1
232	CH8 User range settings offset value	1
233	CH8 User range settings gain value	1

2.4 A68AD (Upgrade to Q68AD-G)

2.4.1 Performance comparison

1	tem	A68AD		
		-10 to 0 to +10VDC		
	Voltage	(Input resistance value: Hardware version K or later: $1M\Omega$, Hardware version J or earlier: $30k\Omega$)		
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)		
		Analog input Digital output		
I/O characteris	ation	+10V +2000		
10 characteris	5005	+5V or +20mA +1000 0V or +4mA ±0		
		-5V or -12mA -1000		
		-10V -2000		
Maximum reso	olution	Voltage: 5mV (1/2000) Current: 20µA (1/1000)		
Overall accura respect to max output value)	acy (Accuracy in ximum digital	±1% (±20)		
Maximum con	aximum conversion speed Max. 2.5ms/channel			
Response time	e	-		
Absolute maxi	imum input	Voltage: ±15V current: ±30mA		

					O:	•	tial change required, ×: Incompatible
		Q	68AD-G			Compatibility	Precautions for replacement
		-10	to 10VDC				
	((Input resistance	e value: 1M Ω or	r more)			
		0 to	20mADC			- 0	
		(Input resista	ance value: 250)Ω)			
		16-bit s					
	(N	ormal resolutio		0			
	•			-16384 to 16383)			
	5						
		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		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 10 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 to 4000	0.375mV	-12000 to 12000	0.333mV		
	0 to 20mA	0 to 4000	5μΑ	0 to 12000	1.66µA		
	4 to 20mA	0 10 1000	4µA	0 10 12000	1.33µA		
Current	4 to 20mA (Expanded mode)	-1000 to 4500	4μΑ	-3000 to 13500	1.33µA		
	Users range setting	-4000 to 4000	1.37µA	-12000 to 12000	1.33µA		
			10.40/				
			±0.1% ution mode: ±4	diait			
	Lich ro	solution mode (•			
	•	•	-	, 0	~i+	0	
	-			e ranges): ±12di	Jir		
	rempera	ature coefficient		(0.00714%/C)			
			ns/channel				The conversion speed of
		(Sam	4	Q68AD-G to A68AD has			
			\triangle	become slow. If fast			
				conversion speed is required			
				for control, the Q64AD is			
							recommended.
			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 wite size	(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	
Weight	Hardware version J or earlier: 0.6kg	

2 ANALOG INPUT MODULE REPLACEMENT

	O : Compatible, \triangle : Part	ial change required, ×: Incompatible
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 Ω or more	0	
Between analog input channels: 500VDC, 10M Ω or more		
16 points	Δ	I/O occupied points has
(I/O assignment: intelligent 16 points)		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

Item	Description	A68AD	Q68AD-G	O : With functions, -: Without functions 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,	0	_	
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	
, in the second s	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.

*1 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.

	A68	BAD		Q68AD-G				
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	Y0 Y1		
X1 X2		Y2		X1 X2		Y2		
X3		Y3		X3	Netwood	Y3		
X4		Y4		X4	Not used	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		ҮВ	В	XB	Channel change completed flag	YB	Channel change request	
ХС		YC		XC	Input signal error detection signal	YC	Not used	
			Not used	XD	Maximum value/	YD	Maximum value/	
XD		YD			minimum value reset		minimum value reset	
	Not used				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 X13		Y12 Y13						
X13 X14		Y14						
X14 X15		Y15						
X16		Y16						
X17		Y17						
X18		Y18						
X19		Y19						
X1A		Y1A						
X1B		Y1B						
X1C		Y1C						
X1D X1E	-	Y1D Y1E						
X1E X1F		Y1E Y1F						
		111		1				

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 specification		1	CH1 Average time/Average number of times/			
•	Averaging processing specification		1	Moving average/Time constant settings			
2	CH1 Averaging time, count		2	CH2 Average time/Average number of times/			
L			2	Moving average/Time constant settings			
3	CH2 Averaging time, count		3	CH3 Average time/Average number of times/			
				Moving average/Time constant settings			
4	CH3 Averaging time, count		4	CH4 Average time/Average number of times/			
		R/W		Moving average/Time constant settings	R/W		
5	CH4 Averaging time, count		5	CH5 Average time/Average number of times/			
				Moving average/Time constant settings			
6	CH5 Averaging time, count		6	CH6 Average time/Average number of times/			
		_		Moving average/Time constant settings			
7	CH6 Averaging time, count		7	CH7 Average time/Average number of times/			
		_		Moving average/Time constant settings			
8	CH7 Averaging time, count		8	CH8 Average time/Average number of times/			
0			0	Moving average/Time constant settings			
9	CH8 Averaging time, count CH1 Digital output value		9	System area (Not used)	-		
10	°	_	10	A/D conversion completed flag			
11 12	CH2 Digital output value CH3 Digital output value	_	11 12	CH1 Digital output value CH2 Digital output value			
12	CH3 Digital output value	_	12	CH2 Digital output value			
13	CH4 Digital output value	R	13	CH4 Digital output value			
14	CH6 Digital output value	_	14	CH4 Digital output value			
15	CH7 Digital output value	_	15	CH6 Digital output value	R		
10	CH8 Digital output value		10	CH7 Digital output value			
17			17	CH8 Digital output value			
10	-		10	Error code			
20			20	Setting range (CH1 to CH4)			
20			20	Setting range (CH5 to CH8)			
22			22	Offset/gain setting mode Offset specification			
23	-		23	Offset/gain setting mode Gain specification	-		
	-			Averaging process specification (CH1 to			
24			24	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	System area (NOL USED)	-		
29			29				
30			30	CH1 Maximum value			
31			31	CH1 Minimum value			
32			32	CH2 Maximum value	ļ		
33			33	CH2 Minimum value	R		
34	Write data error code	R/W	34	CH3 Maximum value			
			to		ļ		
			44	CH8 Maximum value			
			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	3 1 1 1 1 1 1 1 1 1 1	
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	····· • • ···	1
	CH1 Input signal error detection upper limit	1
150	setting value	
to		
158		
150	Mode switching setting	R/W
to		
200	Save data classification setting	R/W
200	System area (Not used)	-
201	CH1 Factory default offset value	-
		-
203	CH1 Factory default gain value	R/W
to	CH9 Eastery default affect value	rt/ VV
232	CH8 Factory default offset value	-
233	CH8 Factory default gain value	

2.5 A68AD-S2 (Upgrade to Q68ADV, Q68ADI)

2.5.1 Performance comparison

14	em	A68AD-S2					
	em						
	Voltage	-10 to 0 to +10VDC					
Analog input		(Input resistance value: Hardware version K or later: $1M\Omega$, Hardware version J or earlier: $30k\Omega$)					
0 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)					
I/O characteristics		Analog input Digital output +10V +2000 +5V or +20mA +1000 0V or +4mA ±0 -5V or -12mA -1000 -10V -2000					
Maximum resc	lution	Voltage: 5mV (1/2000) Current: 20μΑ (1/1000)					
Overall accuracy (Accuracy in respect to maximum digital output value)		Within ±1% (±20)					

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

Q68ADV										Precautions for replacement
		-10 to 10\	/DC		_					
	(Inpu	t resistance	/alue: 1MΩ)		_					The voltage/current cannot be
		_			0 to	20mAD	С			mixed for one module.
					(Input resist	ance valu	ue: 2	50Ω)		
				t signed bina	-					
			(Normal resolut						0	
		High res	olution mode: -	12288 to 122	287, -16384 t	o 16383))			
ļ	Analog	input		olution mode		gh resoluti				As concept of gain value is
	ran	ge	Digital output value	Maximum resolution				aximum solution		changed, refer to [Analog-
		0 to 10V	output value	2.5mV	0 to 10			625mV	Δ	Digital Converter Module
		0 to 5V	0 to 4000	1.25mV				416mV		User's Manual] and then,
Volta	an	1 to 5V		1.0mV	0 to 12	2000 -	0.	333mV		confirm the I/O characteristics.
Volta	ge	-10 to 10V		2.5mV	-16000 to	o 16000	0.	625mV		
		User range settings	-4000 to 4000	0.375mV	-12000 to	0 12000	0.	333mV		
	0 to Current		0 to 4000	5µA	0 to 1	2000	1	.66µA		
Curre			0 10 4000	4µA	0 to 12000		1	.33µA	0	
Us		User range settings	-4000 to 4000	1.37µA	-12000 to	0 12000	1.33µA			
	g inpu nge 0 to 1 -10 t 1 to 5 1 to 5 Use rang settin 0 to 20m 4 to 20m Use rang	t Ambiei C With temperatu drift compensa 0V 5V 5V r r e ±0.3% (±12 digit	drift ion compensation ±0.4%	Ambient temperature 25±5°C	Ambient te	55°C Withou temperat drift	e ut ture ation % gits)	de Ambient temperature 25±5°C ±0.1% (±16 digits) ±0.1% (±12 digits)	0	
	settin					ļ				

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	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	

MELSEC

MELSEC

				\triangle : Partial change required, ×: Incompatible
	Q68ADV	Q68ADI	Compatibility	
(Wh	80µs/cl nen 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	0		
	8 channel	s/module	0	
	Max. 100,	000 times	0	
	Between the I/O terminal and progr photocouple Between channe	0		
	Between the I/O terminal and progr 500VAC, fo		0	
	Between the I/O terminal and prog 500VDC, 20	rammable controller power supply: $M\Omega$ or more	0	
	16 pc (I/O assignment: in		Δ	I/O occupied points has changed to 16 points.
	18-point ter	×		
	0.3 to 0.	×	Wiring change is required.	
	R1.25-3 (A solderless terminal	×		
	0.64A	Δ	The recalculation of internal current consumption [5VDC] is required.	
	0.19kg	0.19kg	0	

2.5.2 Function comparison

Item	Description	A68AD-S2	Q68ADV/I	O: With functions, -: Without functions 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 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.

	A68AD-S2				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	Y1			
					compensation flag				
X2		Y2		X2		Y2			
X3		Y3 Y4		X3 X4		Y3 Y4	Naturad		
X4 X5	-	Y4 Y5		X4 X5	Not used	Y4 Y5	Not used		
X6		Y6		X6		Y6			
X7		Y7		X7		Y7			
X8		Y8		X8	High resolution mode status flag	Y8			
X9		Y9		Х9	Operating condition setting completed flag	Y9	Operating condition setting request		
XA		YA		ХА	Offset/gain setting mode flag	YA	User range write request		
XB		YB		ХВ	Channel change completed flag	YB	Channel change request		
XC		YC		XC	Not used	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		Y10			ı v		· ·		
X11		Y11							
X12		Y12							
X13		Y13							
X14		Y14							
X15 X16		Y15 Y16							
X10 X17		Y17							
X18		Y18							
X19		Y19							
X1A		Y1A							
X1B		Y1B							
X1C	ļ	Y1C							
X1D		Y1D							
X1E	-	Y1E							
X1F		Y1F		J					

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	5.44	4	CH4 Time/count averaging setting	5.44
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	
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	<u> </u>		18	CH8 Digital output value	-
19			19	Error code	- R/W
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	
24	-		24		
25	-		25	-	
26	System area (Not used)	-	26	-	
20	-		20	System area (Not used)	-
28	-		28	-	
29	-		29	-	
30	-		30	CH1 Maximum value	
31	-		31	CH1 Minimum value	
32	-		32	CH2 Maximum value	
					-
33 34	Write data error code	R/W	33 34	CH2 Minimum value CH3 Maximum value	4
34	A/D conversion completed flag	R	34	CH3 Minimum value	4
	AD conversion completed hag	IX.	36	CH4 Maximum value	
			30	CH4 Maximum value	4
			37	CH4 Minimum value CH5 Maximum value	R
			38	CH5 Maximum value	-
					-
			40	CH6 Maximum value	-
			41	CH6 Minimum value	-
			42		-
			43	CH7 Minimum value	4
			44	CH8 Maximum value	4
			45	CH8 Minimum value	

	Q68ADV/I	
Address	Name	Read/write
(Dec.)	Name	iteau/write
46		
to	System area (Not used)	-
157		
158	Mode switching setting	R/W
159	Mode switching setting	10.00
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	
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	1
222	CH3 User range settings offset value	
223	CH3 User range settings gain value	1
224	CH4 User range settings offset value	
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	1
229	CH6 User range settings gain value	1
230	CH7 User range settings offset value	1
231	CH7 User range settings gain value	
232	CH8 User range settings offset value	1
233	CH8 User range settings gain value	

2.6 A68AD-S2 (Upgrade to Q68AD-G)

2.6.1 Performance comparison

lt	tem	A68AD-S2			
Analog input	Voltage	-10 to 0 to +10VDC (Input resistance value: Hardware version K or later: 1MΩ, Hardware version J or earlier: 30kΩ) +4 to +20mADC (Input resistance value: 250Ω)			
Digital output		*Usable current input: -20 to 0 to 20mA 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 resc	blution	Voltage: 5mV (1/2000) Current: 20μΑ (1/1000)			
Overall accura respect to max output value)	ncy (Accuracy in kimum digital	Within ±1% (±20)			

	•	Precautions for replacement					
O:C	O : Compatible, \triangle : Partial change required, ×: Incompatible						

			Q	Compatibility	Precautions for replacement			
			-10	to 10VDC				
		(Input resistance					
			0 to		- 0			
			(Input resista					
			16-bit s	signed binary	-			
		()	lormal resolutio	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		2.5mV	0 to 16000	0.625mV		
	Voltage	0 to 5V	0 to 4000	1.25mV	0 to 12000	0.416mV		
		1 to 5V		1.0mV	01012000	0.333mV		As concept of gain value is
		1 to 5V (Expanded mode)	-1000 to 4500	1.0mV	-3000 to 13500	0.333mV		changed, refer to Q68AD-G [User's Manual] and then, confirm the I/O characteristics.
		-10 to 10V	-4000 to 4000	2.5mV	-16000 to 16000	0.625mV		
		Users range setting	-4000 10 4000	0.375mV	-12000 to 12000	0.333mV		commune i/O characteristics.
		0 to 20mA	0 to 4000	5μΑ	0 to 12000	1.66µA		
		4 to 20mA	0104000	4µA	01012000	1.33µA		
	Current	4 to 20mA (Expanded mode)	-1000 to 4500	4μΑ	-3000 to 13500	1.33µA		
		Users range setting	-4000 to 4000	1.37µA	-12000 to 12000	1.33µA		
				±0.1%				
					diaita			
	Normal resolution mode: ±4 digits High resolution mode (0 to 10V, -10 to 10V): ±16 digits							
		0	· ·	,	, 0		0	
		-	•		e ranges): ±12 dig	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	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	

2 ANALOG INPUT MODULE REPLACEMENT

MELSEC

	O: Compatible	, \triangle : Partial change required, ×: Incompatible
Q68AD-G	Compatibility	Precautions for replacement
10ms/channel		The conversion speed of Q68AD-G to
(Sampling cycle)	•	A68AD has become slow. If fast
20ms		conversion speed is required for
20115		control, the Q64AD is recommended
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 Ω 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)		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	

2.6.2 Function comparison

Item	Description	A68AD-S2	Q68AD-G	O: With functions, -: Without functions 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	Ũ	Ũ		
	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.		Ŭ		
	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.		U		
	The resolution can be switched according to				
Resolution mode	the application. The resolution mode is		~		
Resolution mode		-	0		
	batch-set for all the channels.*1				
Input signal error detection	The voltage/current outside the setting	-	0		
function	range is detected.				
	(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	
				redundant CPU.	

*1 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 X1	Watchdog timer error A/D conversion READY	Y0 Y1		X0 X1	Module READY	Y0 Y1		
X1 X2	A/D CONVEISION READ I	Y2		X2		Y2		
X3		Y3		X3		Y3		
X4		Y4		X4	Not used	Y4	Not we ad	
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	
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				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 X12		Y11 Y12						
X12 X13		Y13						
X14		Y14						
X15		Y15						
X16		Y16						
X17		Y17						
X18		Y18						
X19		Y19						
X1A X1B	4	Y1A Y1B						
X1D X1C	1	Y1C						
X1D	1	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 specification		1	CH1 Average time/Average number of times/	
I	Averaging processing specification			Moving average/Time constant settings	
2	CH1 Averaging time, count		2	CH2 Average time/Average number of times/	
2			2	Moving average/Time constant settings	
3	CH2 Averaging time, count		3	CH3 Average time/Average number of times/	
Ū		_	Ŭ	Moving average/Time constant settings	
4	CH3 Averaging time count		4	CH4 Average time/Average number of times/	
•		R/W	•	Moving average/Time constant settings	R/W
5	CH4 Averaging time, count		5	CH5 Average time/Average number of times/	
			, , , , , , , , , , , , , , , , , , ,	Moving average/Time constant settings	
6	CH5 Averaging time, count		6	CH6 Average time/Average number of times/	
			, , , , , , , , , , , , , , , , , , ,	Moving average/Time constant settings	
7	CH6 Averaging time count		7	CH7 Average time/Average number of times/	
•		_		Moving average/Time constant settings	
8	CH7 Averaging time, count		8	CH8 Average time/Average number of times/	
0			0	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	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	
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	
24	CH1 Digital output valueCH2 Digital output valueCH3 Digital output valueCH4 Digital output valueCH5 Digital output valueCH6 Digital output valueCH7 Digital output value		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		-
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	
35	A/D conversion completed flag	R	to		
			44	CH8 Maximum value	
			45	CH8 Minimum value	

	Q68AD-G	
Address	Name	Read/write
(Dec.)	Name	iteau/write
46	System area (Not used)	-
47	Input signal error detection extended/input	
	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		
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		
150	CH1 Input signal error detection upper limit	
150	setting value	
to		
158	Mode switching setting	R/W
159		
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	1

2.7 A68ADN (Upgrade to Q68ADV, Q68ADI)

2.7.1 Performance comparison

lte	em			A68A	DN			
	Voltage		-10 to 0 to +1	I0VDC (Input		ue: 1MΩ)		
Analog input	Current	-20 to 0 to +20mADC (Input resistance value: 250Ω)						
				16-bit signe	d binary			
Digital output				1/4000 is set				
				1/8000 is set				
			When 1	/12000 is set:	-12288 to +12	2287		
					gital output valu			
		Analog input		5V/20mA, offse				
			4014	1/4000	1/8000	1/12000		
/O characterist	tics		+10V +5V or +20mA	+4000 +2000	+8000 +4000	+12000 +6000		
			0V or 20mA	+2000	+4000 0	+0000		
			-5V or -20mA	-2000	-4000	-6000		
		-10V	-4000	-8000	-12000			
		(Fact	ory-set: gain	.5V. offset 0	V)			
			(1 400	ory oot. gam.		• /		
Maximum resolution		Mallana hara	1/4000	1/8000	1/12000			
			Voltage input Current input	2.5mV 10μA	1.25mV 5µA	0.83mV 3.33µA		
			Ourient input	τομιτ	σμπ	0.00μ/τ		
				1/4000	1/8000	1/12000		
			±1%	±40	±80	±120		
Overall accurac	-							
Accuracy in re								
naximum digita	al output value)							

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

		Q68AD	V		C	esadi		Compa	tibility	Precautions for replacement
		-10 to 10\	/DC			_				
(Input ı	esistance	/alue: 1MΩ)			-				The voltage/current cannot be
					0 to	20mAD	C	<i>\</i>	7	mixed for one module.
		-			(Input resista	ance valu	ue: 250Ω)			
			16-bit	t signed bina	arv					
			(Normal resoluti	-	-			C)	
			、 olution mode: -1							
			Nie maai waa a	lution mode				-		
A	nalog i	nput	Normal reso Digital	Maximum	,	gh resolut	Maximum	_		
	range	9	output value	resolutior			resolution			As concept of gain value is
		0 to 10V		2.5mV	0 to 16		0.625mV			changed, refer to [Analog-
		0 to 5V	0 to 4000	1.25mV	0 to	c	0.416mV		7	Digital Converter Module
Voltag	e	1 to 5V		1.0mV	1200	00	0.333mV			User's Manual] and then,
voltag		-10 to 10V		2.5mV	-16000 to	16000	0.625mV			confirm the I/O characteristics.
	ι	Jser range	-4000 to 4000	0.375mV	-12000 to	12000	0.333mV			
	_	settings 0 to 20mA		5µA			1.66µA	_		
		4 to 20mA	0 to 4000	4μA	0 to 12	2000	1.33µA			
Currer	nt l	Jser range	-4000 to 4000		-12000 to	12000	1.33µA			
		settings	-4000 10 4000	1.37µA	-12000 10	12000	1.55μΑ)	
		N	ormal resolution m	node	High	n resolutio	n mode			
		Ambient	temperature 0 to		Ambient tem	-) to			
Analog	g input	10/:46	55°C	Ambient		°C	Ambie	nt		
ran	ge	With temperatu	Without ire temperature	temperature	With temperature	Witho tempera	ture			
		drift	drift	25±5°C	drift	drift	Z5+5			
		compensa	tion compensation	n	compensation	compens	ation			
	0 to 10'	_			±0.3%	±0.4%	6 ±0.1%			
	-10 to				(±48 digits)	(±64 dig				
	10V 0 to 5\	/								
voltade	1 to 5)	
	User	_								
	range	±0.3%	±0.4%	±0.1%						
:	setting	s (±12 digit		(±4 digits)						
	0 to	, s.	,		±0.3% (±36 digits)	±0.4%				
	00					(±48 dig	jits) (±12 dig	IS)		
	20mA	_			(±50 digits)			,		
Current	4 to				(100 digita)			,		
Current					(100 digita)					
Current	4 to 20mA	-			(100 digita)					
	4 to 20mA User	-								

MEL	SEC
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Item	A68ADN	
item	AddADN	
Maximum conversion speed	20ms/channel	
	Voltage: ±15V	
Absolute maximum input	Current: ±30mA	
Analog input points	8 channel/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	
	(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 (5VDC)	0.4A	
Weight	0.51kg	

analog input module replacement

MELSEC

Q68ADV	Q68ADI	Compatibility	Precautions for replacement
	drift compensation, the time d regardless of the number of channels	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 channe	ls/module	0	
Max. 100,	000 times	0	
Between the I/O terminal and prog photocoup Between channe		0	
Between the I/O terminal and prog 500VAC, fo	rammable controller power supply: or 1 minute	0	
Between the I/O terminal and prog 500VDC, 50	rammable controller power supply: MΩ or more	0	
16 p (I/O assignment: ir		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 termina	with sleeve can not be used.)	×	1
0.64A	0.64A	Δ	The recalculation of internal current consumption [5VDC] is required.
 0.19kg	0.19kg	0	

2.7.2 Function comparison

Item	Description	A68ADN	Q68ADV/I	O : With functions, -: Without functions 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) sused) × 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.

*1 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			Q68/	ADV/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	Y0 Y1	
X2	Error flag	Y2		X2	compensation flag	Y2	
X3		Y3		X3		Y3	
X4 X5		Y4 Y5		X4 X5	Not used	Y4 Y5	Not used
X6		Y6		X6		Y6	
X7		Y7	Not used	X7	High resolution mode	Y7	
X8		Y8		X8	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
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		YF		XF	Error flag	YF	Error clear request
X10		Y10	Netwood				
X11		Y11	Not used				
X12		Y12	Error reset				
X13		Y13					
X14		Y14					
X15		Y15					
X16		Y16					
X17		Y17					
X18		Y18					
X19 X1A		Y19 Y1A	Not used				
X1A X1B		Y1B					
X1D X1C		Y1C					
X1D	RFRP, RTOP instruction	Y1D					
X1E	for interlock signal when	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
(Dec.) 0	A/D conversion enable/disable setting		(Dec.)	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		4	CH4 Time/count averaging setting	
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	
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	-	19	Error code	
20	Resolution setting	R/W	20	Setting range (CH1 to CH4)	
	5		21	Setting range (CH5 to CH8)	
				Offset/gain setting mode	
			22	Offset specification	
				Offset/gain setting mode	R/W
			23	Gain specification	
			24		
			25		
			26		
			27	System area (Not used)	-
			28		
			29		
			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	
				CH4 Maximum value CH4 Minimum value	
			36		
			36 37	CH4 Minimum value	
			36 37 38	CH4 Minimum value CH5 Maximum value	R
			36 37 38 39	CH4 Minimum value CH5 Maximum value CH5 Minimum value	R
			36 37 38 39 40 41	CH4 Minimum value CH5 Maximum value CH5 Minimum value CH6 Maximum value CH6 Minimum value	R
			36 37 38 39 40 41 42	CH4 Minimum value CH5 Maximum value CH5 Minimum value CH6 Maximum value CH6 Minimum value CH7 Maximum value	R
			36 37 38 39 40 41	CH4 Minimum value CH5 Maximum value CH5 Minimum value CH6 Maximum value CH6 Minimum value	R

	Q68ADV/I	
Address	Nama	Dead/write
(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		
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	EV/ V V
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

lte	m		A68A	DN	
	Voltage	-10 to 0 to -	+10VDC (Input	resistance val	ue: 1MΩ)
Analog input	Current	-20 to 0 to +2	20mADC (Input	t resistance va	lue: 250Ω)
			16-bit signe	ed binary	
Digital output		Whe	n 1/4000 is set	:: -4096 to +40	95
Jigital output		Whe	n 1/8000 is set	:: -8192 to +81	91
		When	1/12000 is set:	-12288 to +12	2287
			D	igital output valu	ie
		Analog input	(When gai	n 5V/20mA, offs	et 0V/0mA)
			1/4000	1/8000	1/12000
/O characteristi	rs.	+10V	+4000	+8000	+12000
o characteristi	63	+5V or +20mA	+2000	+4000	+6000
		0V or 20mA	0	0	0
		-5V or -20mA	-2000	-4000	-6000
		-10V	-4000	-8000	-12000
		(Fa	ctory-set: gain.	5V, offset0	∕)
1aximum resolu	ution		1/4000	1/8000	1/12000
aximum resolu		Voltage input	2.5mV	1.25mV	0.83mV
		Current input	10µA	5μΑ	3.33µA
overall accuracy			1/4000	1/8000	1/12000
Accuracy in res	-	±1%	±40	±80	±120
aximum digita	l output value)	L			

					0	Compatible, \triangle : Par	tial change required, ×: Incompatible
		Q	68AD-G			Compatibility	Precautions for replacement
		-10	to 10VDC				
	((Input resistance value: $1M\Omega$ or more)					
		0 to	20mADC	· ·		- 0	
		(Input resista	ance value: 25	ί0Ω)			
				,			
	16-bit signed binary						
	•	lormal resolution	0				
	High resol	ution mode: -12	288 to 12287,	-16384 to 16383)			
		Normal reso	lution mode	High resolu	tion mode		As concept of gain value is changed, refer to Q68AD-G [User's Manual] and then, confirm the I/O characteristics.
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		
Voltage	1 to 5V	-1000 to 4500	1.0mV	-3000 to 13500	0.333mV		
	(Expanded mode)						
	-10 to 10V	-4000 to 4000	2.5mV	-16000 to 16000	0.625mV		
	Users range setting		0.375mV	-12000 to 12000	0.333mV		
	0 to 20mA	0 to 4000 -1000 to 4500	5µA	0 to 12000	1.66µA		
Current	4 to 20mA 4 to 20mA		4µA		1.33µA		
Current	4 to 20mA (Expanded mode)		4μΑ	-3000 to 13500	1.33µA		
	Users range setting	-4000 to 4000	1.37µA	-12000 to 12000	1.33µA		
			±0.1%				
		Normal resolu		diaits			
High resolution mode (0 to 10V, -10 to 10V): ± 16 digits						0	
	High resolution mode (Other than the above ranges): ± 12 digits						
	0	ature coefficient:		U , U	jito		
	rempera	ature coemclent.	. ±i 1.4ppin/ C	(0.00714707C)			

. artial ch

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				
Connected terminal	(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	1			
Internal current consumption (5VDC)	0.4A				
Weight	0.51kg				

	O: Compatible	, \triangle : Partial change required, ×: Incompatible
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 Ω or more	0	
Between analog input channels: 500VDC, 10M Ω or more		
16 points	Δ	I/O occupied points has changed to
(I/O assignment: intelligent 16 points)		16 points.
40-pin connector	×	-
Within 0.3mm ²	×	Wiring change is required.
-	×	Î
0.46A	Δ	The recalculation of internal current consumption [5VDC] is required.
0.16kg	0	

2.8.2 Function comparison

ltem	Description	A68ADN	Q68AD-G	O : With functions, -: Without functions 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	
A/D conversion enable/disable Sampling processing Averaging processing Primary delay filter Maximum and minimum values	channels that are not used, the sampling	Ũ	Ŭ	
	time can be shortened.			
	The A/D conversion for analog input values			
	is performed successively for each channel,		0	
Sampling processing	and the digital output value is output upon	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
Maximum and minimum values	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.	_	U	
	The resolution can be switched according to			
Pasalution mode	the application. The resolution mode is	0	~	
Resolution mode		0	0	
	batch-set for all the channels.*1			
	The voltage/current outside the setting	-	0	
function	range is detected.			
	(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			
Scaling function	into 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
	-,gotoppod.			redundant CPU.

*1 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.

	A68ADN			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	Error flag	Y2		X2		Y2	
X3 X4		Y3 Y4		X3 X4	Not used	Y3 Y4	
X5		14 Y5		X4 X5		Y5	Not used
X6		Y6		X6		Y6	
X7		Y7		X7	High resolution mode status flag	Y7	
X8		Y8	Not used	X8	Warming output signal	Y8	
X9		Y9		X9	Operating condition	Y9	Operating condition
73		15		7.5	setting completed flag	13	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
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		YF		XF	Error flag	YF	Error clear request
X10		Y10	Not used				
X11		Y11					
X12 X13		Y12 Y13	Error reset				
X13 X14		Y14					
X14 X15		Y15					
X16		Y16					
X17		Y17					
X18		Y18					
X19		Y19	Not used				
X1A		Y1A					
X1B		Y1B					
X1C	RFRP, RTOP instruction	Y1C					
X1D X1E	for interlock signal when	Y1D Y1E					
X1E X1F	A68ADN is used in	Y1F					
	remote I/O station						

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 encotication	Read/write	1	CH1 Average time/Average number of times/		
1	Averaging processing specification	Read/write (Dec.) 0 1 2 3 4 2 3 4 R/W 5 6 7 8 9 9 10 11 12 13 14 15 16 17 18 19 19		Moving average/Time constant settings		
2	CH1 Averaging time, count	Read/write (Dec.) 0 A/I 1 CF 2 CF 3 CF 3 CF 3 CF 4 CF 6 Mc 7 CF 6 Mc 7 CF 8 CF 9 Sy 10 A/I 9 Sy 11 CF 13 CF 14 CF 12 CF 13 CF 14 CF 15 CF 16 CF 17 CF 18 CF 19 Err 18 CF 19 Err 22 Off 23 Off 24 Av 25 Av 26 27 28	CH2 Average time/Average number of times/			
2	CH1 Averaging time, count	Read/write (Dec.) 0 A/D c 1 CH1 1 Movin 2 CH2 Movin 3 3 CH3 Movin 4 CH4 Movin 4 CH4 Movin 6 CH5 Movin 6 CH6 Movin 7 CH7 Movin 7 CH7 Movin 9 9 Syste 10 A/D c 11 CH1 12 CH2 13 CH3 Movin 9 9 Syste 10 A/D c 11 CH1 12 CH2 13 CH3 14 CH4 15 CH5 16 CH6 17 CH7 18 CH8 19		Moving average/Time constant settings		
3	CH2 Averaging time, count			CH3 Average time/Average number of times/		
5			J	Moving average/Time constant settings		
4	CH3 Averaging time, count		4	CH4 Average time/Average number of times/		
4			4	Moving average/Time constant settings	R/W	
5	CH4 Averaging time, count	D/ W	5	CH5 Average time/Average number of times/		
5			5	Moving average/Time constant settings		
6			6	CH6 Average time/Average number of times/		
6	CH5 Averaging time, count		0	Moving average/Time constant settings		
7		1	7	CH7 Average time/Average number of times/		
7	CH6 Averaging time, count		1	Moving average/Time constant settings		
0			0	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	_	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)		
	L G		21	Setting range (CH5 to CH8)		
			22	Offset/gain setting mode Offset specification		
			23	Offset/gain setting mode Gain specification		
				Averaging process specification (CH1 to		
			24		R/W	
			25	Averaging process specification (CH5 to CH8)		
			26			
			27			
			28	System area (Not used)	-	
				1		
			30	CH1 Maximum value		
			31	CH1 Minimum value	1	
			32	CH2 Maximum value	1	
			33	CH2 Minimum value		
			34	CH3 Maximum value	R	
					4	
			to			
			to 44	CH8 Maximum value		

	Q68AD-G	
Address (Dec.)	Name	Read/write
46	System area (Not used)	-
47	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		
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]
150	CH1 Input signal error detection upper limit]
150	setting value	
to		
158	Mode switching setting	
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	1

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)
Analog output module	A616DAI	Q68DAIN	 External wiring : Cable size is changed. Number of slots : Changed (2 modules are required.) Program : The number of occupied I/O points, I/O signals, and buffer memory addresses are changed. Performance specifications change: 8CH/module 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
	A62DA	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: Output current (minus current not applicable), I/O characteristics 5) Functional specifications: Not changed
		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
	A62DA-S1	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: Not changed 5) Functional specifications: Not changed
		Q64DAN	 External wiring : Cable size is changed. Number of slots : Not changed Program : 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
	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 disco	ction discontinuation		Transition to Q series		
Product	Model	Model	Remarks (Restrictions)		
Analog output module	A68DAV	Q68DAVN	 External wiring : Cable size is changed. Number of slots: : Not changed Program : The number of occupied I/O points, I/O signals, and buffer memory addresses are changed. Performance specifications change: Increase in current consumption Functional specifications: Not changed 		

⊠Point -

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

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

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

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					
Analog output	0 to 20mADC					
	(External load resistance value: 0Ω to 600Ω)					
	Digital input Analog output					
I/O characteristics	+4000 +20mA					
	+2000 +12mA					
	0 4mA					
Digital value resolution	1/4000					
Digital value resolution	1/4000					
Overall accuracy						
(Accuracy at maximum analog	0.6% (±120µA)					
output value)	When ambient temperature is 25°C: ±0.3% (±60µA)					
Sampling period	1.5 + 0.5 × (D/A number of conversion enabled channels) ms					
	0.5ms					
Conversion time	(Time required for conversion from 0 to 20mA/20mA to 0mA)					
Absolute maximum output	-					
No. of analog output channels	16 channels/module					
No. of analog output channels						
Number of writes to E ² PROM	-					
Output short protection	-					

	0.00000	
Q68DAIN	Compatibility	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)	0	
Analog output range Normal resolution mode High resolution mode 0 to 20mA 0 to 4000 5µA 0 to 12000	0	
Current 4 to 20mA 6 to 1000 4 μA 6 to 1000 1.33μA User range -4000 to 1.5μA -12000 to 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	
21mA	0	
8 channels/module	Δ	Consider replacement with multiple Q68DAIN.
Max. 100,000 times	0	
Available	0	

3 ANALOG OUTPUT MODULE REPLACEMENT

MELSEC	
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lte	em	A616DAI					
Isolation metho	d	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 term	ninal	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					
Internal current (5VDC)	consumption	0.3A					
	Voltage	+15VDC/-15VDC					
External	Current +15VDC, 0.53A						
power supply	consumption	-15VDC, 0.125A					
	Inrush current						
Weight		0.69kg					

3 ANALOG OUTPUT MODULE REPLACEMENT

	O : Compatible	, \triangle : Partial change required, ×: Incompatible
Q68DAIN	Compatibility	Precautions for replacement
Between the I/O terminal and programmable controller power supply:		
photocoupler isolation	0	
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)	\triangle	has changed to 16 points.
18-point terminal block	×	
0.3 to 0.75mm ²	×	Ī
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
0.004		consumption (5VDC) is required.
24VDC +20%, -15%		
Ripple, spike 500mV _{P-P} or less		As the external power supply has
0.074	×	changed from ±15V to 24V, its change
0.27A		is required.
2.5A 230µs or less		
0.20kg	0	

3.2.2 Functional comparison

Item	Description		A616DAI		With functions, -: Without functions Precautions for replacement
	Specifies whether to enable or disable the D/A conve				
D/A conversion enable/	for each channel.				
disable function	By disabling the D/A conversion for the channels that	at are	0	0	
	not used, the conversion speed can be shortened.				
	Specifies whether to output the D/A conversion value	or the			On Q68DAIN, the output
D/A output enable/	offset value for each channel.				enable/disable is set with Y
disable function	The conversion speed stays constant regardless of		0	0	signal (CHD 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	e			
	output request (YD) is set to ON and the time specifi				
Synchronous output	"programmable controller CPU processing time + 12	ύμε		0	
function	has elapsed.		-	0	
	However, the analog output will be fixed to CH1, and	dother			
	channels (CH2 to CH8) cannot be used.				
	When the module is mounted on a remote I/O station				
	analog output will not be synchronized because of a				
	scan delay if the synchronous output function is spec	cified.			
				0	1) 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		Manual to check the
CLEAR function	error occurs.	er un	Ŭ		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 va	lue			
	when CHD Output enable/disable flag is forcibly turr	ned on			
	while the programmable controller CPU is in the STC	OP			
Analog output test while	status.				
the programmable					
controller CPU is in the	Setting D/A conversion Enable Disab	le	-	0	
STOP status	combi	_			
STOP Status	nation CH□ Output enable/disable flag Enable Disable Enable D	Disable			
	Not Not				
	Analog output test Allowed Allowed Not allow	wed			
	Switches the resolution mode according to the applic	cation.			
Resolution mode	The resolution can be selected from 1/4000 or 1/120		-	0	
	The resolution mode is batch-set for all channels.			0	
					Replaceable modules during
Online module	Replaces a module without stopping the system.		-	0	online are the Process 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.		Device No.	Signal name	Device No.	Signal name	Device No.	Signal name		
X0	Watchdog timer error flag	Y0		X0	Module READY	Y0	Not used		
N/A	D/A conversion READY						CH1 Output enable/		
X1	flag	Y1		X1		Y1	disable flag		
X2	Error flag	Y2		X2		Y2	CH2 Output enable/		
_	, , , , , , , , , , , , , , , , , , ,						disable flag CH3 Output enable/		
X3		Y3		X3		Y3	disable flag		
X 4				V.	Natural		CH4 Output enable/		
X4		Y4		X4	Not used	Y4	disable flag		
X5		Y5		X5		Y5	CH5 Output enable/		
	-						disable flag		
X6		Y6	Not used	X6		Y6	CH6 Output enable/ disable flag		
							CH7 Output enable/		
X7		Y7		X7		Y7	disable flag		
X8		Y8		X8	High resolution mode	Y8	CH8 Output enable/		
70		10		70	status flag	10	disable flag		
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		
VD		VD	ХВ	Channel change	VD				
XB		YB			completion flag	YB	Channel change reques		
XC	Not used	YC		XC	Setting value change	YC	Setting value change		
	-				completion flag		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		
XE		YF		XF	Error flag	YF	Error clear request		
X10		Y10			Ŭ		· · ·		
X11		Y11							
X12	-	Y12							
X13	-	Y13							
X14 X15	-	Y14 Y15	Not used						
X15 X16		Y16	Not used						
X17	-	Y17							
X18		Y18							
X19		Y19							
X1A		Y1A	-						
X1B	4	Y1B	Output enable batch flag						
X1C		Y1C							
X1D X1E	RFRP, RTOP instruction	Y1D Y1E	Not used						
X1E X1F	interlock signal	Y1F							
	1								

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 (decimal)	Name	Read/write	Address (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 yead)		
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			22	Offset/gain setting mode		
22	CH6 Digital value		22	Offset specification		
23		R/W	23	Offset/gain setting mode	R/W	
23	CH7 Digital value	F\/ 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			

analog output module replacement

	A616DAI			Q68DAIN														
Address	Name	Read/write	Address	Name	Read/write													
(decimal)		ricua, write	(decimal)		Redui/ Write													
48	CH0 Setting value check code	-	48															
49	CH1 Setting value check code		49															
50	CH2 Setting value check code	-	50															
51 52	CH3 Setting value check code	-	51 52															
53	CH4 Setting value check code CH5 Setting value check code	-	52															
54	CH6 Setting value check code	- - - R/W		_ 	R/W	- - R/W	54											
55	CH7 Setting value check code						- R/W	R/W			· ·				-	55		
56	CH8 Setting value check code								56									
57	CH9 Setting value check code	-	57	System area (Not used)	-													
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	Mada awitching actting	R/W													
			159	Mode switching setting	K/ 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														
			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														
			213 214	CH6 Industrial shipment settings gain value														
			214	CH7 Industrial shipment settings offset value CH7 Industrial shipment settings gain value														
			215	CH8 Industrial shipment settings offset value														
			210	CH8 Industrial shipment settings gain value														
			217	CH1 User range settings offset value	R/W													
			210	CH1 User range settings gain value	1													
			220	CH2 User range settings offset value														
			221	CH2 User range settings gain value														
			222	CH3 User range settings offset value	1													
			223	CH3 User range settings gain value	1													
			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														
			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														

3.3 A616DAV

3.3.1 Performance comparison

Item			A616DAV				
		6-hit sic		nart [.] 12 hit	c)		
Digital input	16-bit signed binary (Data part: 12 bits) Setting range: -4096 to 4095						
	W	hen out	put voltage range	setting is 1	0V:		
			-10V to 0V to +1	-			
Analog output			ad resistance valu		,		
	N	/hen out	tput voltage range	-	5V:		
	(Ex	ernal lo	-5V to 0V to +5 ad resistance valu		MO)		
			Analog	output			
	Digit	al input	5V setting	10V setti	ng		
I/O characteristics		1000	+5V	+10V			
	+2	2000	+2.5V	+5V			
	-2	0	0V -2.5V	0V -5V			
	-4	000	-5V	-10V			
Digital value resolution			1/4000				
Overall accuracy	Output voltage range setting		10V			5V	
(accuracy at maximum analog	Ambient temperature (0 to 55°C)		±0.6% (±60m\	/)		±0.6% (±30mV)	
output value)	Ambient temperature (25°C)		±0.3% (±30m\			±0.3% (±15mV)	
Sampling period	1.5 + 0.5 ×	(D/A nur	mber of conversio	on enabled of	channels)	ms	
Conversion time	(Time requi	red for a	0.5ms - conversion from	10 to +10\//	+10 to -10		
Absolute maximum output			15V	10 10 1 10 1/	10 10 - 10	50)	
No. of analog output channels			16 channels/mo	dule			
			-				
Number of writes to E ² PROM			-				
Output short protection			-				
le el effere se effere d	Between the output terminal	and pro	grammable contro	oller power	supply: pl	hotocoupler isolation	
Isolation method		A616[DAV channels: no	n-isolation			
Dielectric withstand voltage			-				
Insulation resistance			-				
			32 points				
Number of 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 solderless terminal	V	′1.25-3,	V1.25-YS3A, V2-	-S3, V2-YS	3A		
Internal current consumption (5VDC)			0.38A				

								$O: Compatible, \triangle: Partial change required, \textbf{x}: Incompatible$			
				Q68DAVN			Compatibility	Precautions for replacement			
				signed binary	_						
			Normal resoluti		0						
		High reso	lution mode: -1	2288 to 12287	7, -16384 to 1638	33)					
		-10 to 10VI	DC (External lo	ad resistance	0						
			•		1						
	Ana	log output		olution mode	High resolu			M/hon using AG1GDA)/hlin [Eta LE)/l			
		range	Digital input	Maximum	Digital input	Maximum		When using A616DAVN in [-5 to + 5V] range, Q68DAV can obtain equivalent			
		0 to 5V	value	resolution 1.25mV	value	resolution 0.416mV	0	resolution or more than A616DAV by			
		1 to 5V	0 to 4000	1.0mV	0 to 12000	0.333mV	0	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		resolution mode of user range.			
	-						0				
	-				n ±0.1% (±10mV)		0				
	-	Ambient	temperature 0	to 55°C: With	in ±0.3% (±30m∖	′)	Ũ				
				-							
			80	µs/channel			0				
				±12V			0				
			8 cha	innels/module			<u>ک</u>	Consider replacement with multiple Q68DAVN.			
			Max.	100,000 times	3		0				
				Available			0				
	B	atwoon the L/C			e controller power	supply:	0				
				oupler isolatio	n	supply.	0				
	Bet				utput: transforme	r isolation					
) terminal and	-	e controller power		0				
	В	etween the I/C	D terminal and		e controller powe	r supply:	0				
	16 points (I/O assignment: intelligent 16 points)						Δ	The number of occupied I/O points has changed to 16 points.			
	1			t terminal bloo			×				
	0.3 to 0.75mm ² FG terminal: R1.25-3, 1.25-YS3, RAV1.25-3, V1.25-YS3A Terminals other than FG: R1.25-3						×	1			
								Wiring change is required.			
							×				
		(Sle	eved solderles								
				0.38A			0				

Item		A616DAV	
Eutomal	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, ×: 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

Item	Description	A616DAV		: With functions, -: Without functions Precautions for replacement
D/A conversion enable/disable function	Specifies whether to enable or disable the D/A conversion for each channel. By disabling the D/A conversion for the channels that are not used, the conversion speed can be shortened.	0	0	
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 Q68DAVN, 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	 Refer to ("Analog output status combination list" in the Digital-Analog Converter Module User's Manual to check the execution status of output. 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 ID Output enable/disable flag is forcibly turned on while the programmable controller CPU is in the STOP status. Setting combination D/A conversion enable/disable Enable Disable CHID Output enable/disable Enable Disable Disable Analog output test Allowed Not allowed Not allowed	-	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.

3.3.3 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	Cinnel neme	Device	Cinnel nome	Device	Cinnel neme	Device		
No.	Signal name	No.	Signal name	No.	Signal name	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	11				11	disable flag	
X2	Error flag	Y2		X2		Y2	CH2 Output enable/	
72		12		72		12	disable flag	
Х3		Y3		X3		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	Natural	X6		Y6	CH6 Output enable/	
			Not used				disable flag	
X7		Y7		X7		Y7	CH7 Output enable/ disable flag	
	-				High resolution mode		CH8 Output enable/	
X8		Y8		X8	status flag	Y8	disable flag	
					Operating condition		Operating condition	
X9		Y9		X9	setting completion flag	Y9	setting request	
					Offset/gain setting mode			
XA		YA		XA	status flag	YA	User range write request	
VD		VD		ХВ	Channel change	YB		
XB		YB			completion flag		Channel change request	
XC	Not used	YC			Setting value change	YC	Setting value change	
XC		10		70	completion flag	10	request	
XD		YD		XD	Synchronous output	YD	Synchronous output	
	-		RFRP, RTOP instruction		mode flag		request	
XE		YE	interlock signal	XE	Not used	YE	Not used	
XF		YF		XF	Error flag	YF	Error clear request	
X10 X11		Y10						
X11 X12		Y11 Y12						
X12 X13	-	Y13						
X13		Y14						
X14 X15	1	Y15	Not used					
X16		Y16						
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						
X1F		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	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 (Naturad)		8	CH8 Digital value		
9	System area (Not used)	-	9	System area (Not yead)		
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	1	21	Setting range (CH5 to CH8)		
22			22	Offset/gain setting mode		
22	CH6 Digital value		22	Offset specification		
23		R/W	23	Offset/gain setting mode	R/W	
23	CH7 Digital value	F\/ 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			

analog output module replacement

	A616DAV			Q68DAVN	
Address (decimal)	Name	Read/write	Address (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		56	System area (Not used)	-
57	CH9 Setting value check code		57		
58	CHA Setting value check code		58		
59 60	CHB Setting value check code		59 60		
61	CHC Setting value check code CHD Setting value check code		61		
62	CHE Setting value check code		62		
63	CHF Setting value check code		63		
00			to		
			157		
			158		
			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	
			215 216	CH7 Industrial shipment settings gain value	
			210	CH8 Industrial shipment settings offset value CH8 Industrial shipment settings gain value	
			217	CH1 User range settings offset value	R/W
			210	CH1 User range settings gain value	
			219	CH2 User range settings offset value	
			220	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	1
			229	CH6 User range settings gain value	1
			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	

3.4 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 1MΩ) Current: +4 to +20mADC (External load resistance value: 0Ω to 600Ω) *Current output is usable by -20 to +20mA.			
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	-			

							, \triangle : Partial change required, ×: Incompatible
Hi	Normal gh resolution i	16-bit sig		96 to 4095	16383	Compatibility △	Precautions for replacement According to the I/O conversion characteristics used, make the output range setting and offset/gain setting of the Q62DAN.
	·	Current: 0	nce value: to 20mAD	1kΩ to 1MΩ)		0	The minus current cannot be output.
Analog	g output range	Normal r mc Digital input value	ode	High res mor Digital input value	de		
	0 to 5V 1 to 5V	0 to 4000	1.25mV 1.0mV	0 to 12000	0.416mV 0.333mV		According to the I/O conversion
Voltage		-4000 to	2.5mV	-16000 to 16000	0.625mV	Δ	characteristics used, make the output range setting and offset/gain setting
	User range settings	4000	0.75mV	-12000 to 12000	0.333mV		of the Q62DAN.
Curren	0 to 20mA t 4 to 20mA User range	0 to 4000 -4000 to	5 ⊭ A 4 ⊭ A	0 to 12000 -12000 to	1.66µA 1.33µA		
	settings	4000	1.5 <i>µ</i> A	12000	0.83µA		
	volt) Ambient te	age: ±10m\	/, current: ± 0 to 55°C:	within ±0.3%		0	
		80µs/	channel			0	
Voltage: ±12V Current: 21mA						Δ	The minus current cannot be output.
2 channels/module						0	
),000 times	;		0	
		Ava	ilable			0	

3 ANALOG OUTPUT MODULE REPLACEMENT

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

3 ANALOG OUTPUT MODULE REPLACEMENT

		, Δ : Partial change required, ×: Incompat
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	

3.4.2 Functional comparison

				O : Available, - : Not available
Item	Description	A62DA	Q62DAN	Precautions for replacement
Analog output HOLD/CLEAR	Retains an analog value that was output			
Analog output HOLD/CLEAR function	when the programmable controller CPU is	-	0	
lunction	in the STOP status or an error occurs.			
D/A conversion enable/disable	Specifies whether to enable or disable the		~	
function	D/A conversion.	-	0	
D/A output enable/disable	Specifies whether to output the D/A			The Q62DAN specifies whether
function	conversion value or the offset value.	0	0	to enable or disable output for
lunction	conversion value of the onset value.			each channel.
Synchronous output function	Obtains analog output synchronized with		0	
Synchronous output function	the programmable controller CPU.	-	U	
	Outputs the analog value converted from a			
Analog output test while the	digital value when CH□ Output enable/			
programmable controller CPU is	disable flag is forcibly turned on while the	-	0	
in the STOP status	programmable controller CPU is in the			
	STOP status.			
	Switches the resolution mode according to			
	the application.			
Resolution mode	The resolution can be selected from 1/4000,		~	
Resolution mode	1/12000, or 1/16000.	-	0	
	The resolution mode is batch-set for all			
	channels.			
	Replaces a module without stopping the			Replaceable modules during
Online module replacement		-	0	online are the Process CPU and
	system.			the Redundant CPU.

O: Available, - : Not available

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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.

A62DA				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/
							disable flag
X2		Y2		X2		Y2	CH2 Output enable/ disable flag
X3		Y3		X3	Not used	Y3	<u> </u>
X4		Y4		X4		Y4	
X5		Y5		X5		Y5	
X6		Y6		X6		Y6	Not used
X7		Y7		X7		Y7	
X8		Y8		X8	High resolution mode status flag	Y8	
X9		Y9		X9	Operating condition setting completion flag	Y9	Operating condition setting request
ХА		YA	Notwood	ХА	Offset/gain setting mode status flag	YA	User range write request
XB		YB	Not used	XB	Channel change completion flag	YB	Channel change request
XC		YC		XC	Setting value change completion flag	YC	Setting value change 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		Y11					
X12		Y12					
X13		Y13					
X14 X15		Y14 Y15					
X15 X16		Y16					
X10 X17		Y17					
X18		Y18	CPU selection signal				
X19		Y19	Sign of CH1 digital input				
X1A		Y1A	Sign of CH2 digital input				
X1B		Y1B	Output enable				
X1C		Y1C					
X1D		Y1D	Not used				
X1E		Y1E					
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 (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	R/W	
2	CH1 Voltage setting value check code		2	CH2 Digital value		
3	CH2 Voltage setting value check code	R/W	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	ĸ	
			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	R/W	
				Offset specification		
			23	Offset/gain setting mode		
				Gain specification		
			24	Offset/gain adjusted value specification		
			25			
			to	System area (Not used)	-	
			157			
			158	Mode switching setting	R/W	
			159			
			160			
			to	System area (Not used)	-	
			199	Deep data algoritization patting		
			200	Pass data classification setting	R/W	
			201 202	System area (Not used) CH1 Industrial shipment settings offset value	-	
			202			
			203	CH1 Industrial shipment settings gain value		
			204	CH2 Industrial shipment settings offset value CH2 Industrial shipment settings gain value		
			205	CH1 User range settings offset value	R/W	
			200	CH1 User range settings gain value		
			207	CH2 User range settings offset value		
			200	CH2 User range settings gain value		

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 1MΩ) Current: +4 to +20mADC (External load resistance value: 0Ω to 600Ω) *Current output is usable by -20 to +20mA.					
I/O characteristics	Digital input Analog output Voltage +2000 +10V +1000 +5V +1000 +5V 0 0V -1000 -5V -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	-					

		064	4DAN			Compatibility	, △ : Partial change required, ×: Incompatible Precautions for replacement
16-bit signed binary (Normal resolution mode: -4096 to 4095, High resolution mode: -12288 to 12287, -16384 to 16383)						According to the I/O conversion characteristics used, make the output range setting and offset/gain setting of the Q64DAN.	
Voltage: -10 to 10VDC (External load resistance value: 1kΩ to 1MΩ) Current: 0 to 20mADC (External load resistance value: 0Ω to 600Ω)					0	The minus current cannot be output.	
Analog	output range	Normal resolution mode mode					
	0 to 5V	Digital input value 0 to	resolution 1.25mV	Digital input value 0 to	resolution 0.416mV		According to the I/O conversion characteristics used, make the output range setting and offset/gain setting of the Q64DAN.
Voltage	1 to 5V -10 to 10V	4000 -4000 to	1.0mV 2.5mV	12000 -16000 to 16000	0.333mV 0.625mV	Δ	
	User range settings	4000	0.75mV	-12000 to 12000	0.333mV		
Current	0 to 20mA 4 to 20mA	0 to 4000	5 ⊭ A 4 ⊭ A	0 to 12000	1.66⊭A 1.33⊭A		
	User range settings	-4000 to 4000	1.5 <i>µ</i> A	-12000 to 12000	0.83µA		
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.	
4 channels/module				0			
Max. 100,000 times Available				0			

3 ANALOG OUTPUT MODULE REPLACEMENT

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Item		A62DA					
Isolation method		Between the output terminal and programmable controller power supply: photocoupler isolation (Between channels: non-isolation)					
Dielectric withstand voltage		-					
Insulation resistance		-					
Number of occupied I/O points		32 points (I/O assignment: special 32 points)					
Connected terminal		20-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)		0.6A					
External	Voltage	21.6 to 26.4VDC					
power supply	Current consumption	0.35A					
	Inrush current	2.4A					
Weight		0.5kg					

$\mathbf 3$ analog output module replacement

		: Partial change required, ×: Incompatible
Q64DAN	Compatibility	Precautions for replacement
Between the I/O terminal and programmable controller power supply:		
photocoupler isolation	0	
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.)		
0.34A	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	Retains an analog value that was output			
function	when the programmable controller CPU is	-	0	
lunction	in the STOP status or an error occurs.			
D/A conversion enable/disable	Specifies whether to enable or disable the		~	
function	D/A conversion.	-	0	
D/A output enable/disable	Specifies whether to output the D/A	0	0	The Q64DAN specifies whether
function	conversion value or the offset value.			to enable or disable output for
lunction	conversion value of the onset value.			each channel.
Synchronous output function	Obtains analog output synchronized with	-	0	
Synchronous output function	the programmable controller CPU.			
	Outputs the analog value converted from a			
Analog output test while the	digital value when CH□ Output enable/			
programmable controller CPU is	disable flag is forcibly turned on while the	-	0	
in the STOP status	rogrammable controller CPU is in the			
	STOP status.			
	Switches the resolution mode according to	-	0	
	the application.			
Resolution mode	The resolution can be selected from 1/4000,			
Resolution mode	1/12000, or 1/16000.			
	The resolution mode is batch-set for all			
	channels.			
	Replaces a module without stopping the	_	0	Replaceable modules during
Online module replacement				online are the Process CPU and
	system.			the Redundant CPU.

O: Available, - : Not available

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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.

	A62		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
X3		Y3		Х3	Not used	Y3	CH3 Output enable/ disable flag
					Not used		CH4 Output enable/
X4		Y4		X4		Y4	disable flag
X5		Y5		X5		Y5	
X6		Y6		X6		Y6	
X7		Y7		X7		Y7	Not used
X8		Y8		X8	High resolution mode	Y8	
					status flag		-
X9		Y9		X9	Operating condition	Y9	Operating condition
					setting completion flag Offset/gain setting mode		setting request
XA		YA	Not used	XA	status flag	YA	User range write request
					Channel change		
XB		YB		XB	completion flag	YB	Channel change request
XC		YC		ХС	Setting value change	YC	Setting value change
70		10		70	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		Y11					
X12 X13		Y12 Y13					
X13		Y14					
X15		Y15					
X16		Y16					
X17		Y17					
X18		Y18	CPU selection signal				
X19		Y19	Sign of CH1 digital input				
X1A		Y1A	Sign of CH2 digital input				
X1B		Y1B	Output enable				
X1C	4	Y1C					
X1D X1E	-	Y1D Y1E	Not used				
X1E X1F	1	Y1E Y1F					
AIF		I IF		I			

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	Name	Read/write	Address	Name	Read/write
(decimal) 0	CH1 Digital value		(decimal) 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	D/ W
4	CH1 Current setting value check code	_	4	CH4 Digital value	
5	CH2 Current setting value check code	_	5		
Ŭ	on 2 our ent setting value sheak oode		to	System area (Not used)	_
			10		
			10	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)	-
				Offset/gain setting mode	
			22	Offset specification	R/W
				Offset/gain setting mode	
			23	Gain specification	
			24	Offset/gain adjusted value specification	
			25		
			to	System area (Not used)	-
			157		
			158		DAA
			159	Mode switching setting	R/W
			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	ļ
			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	ļ
			213	CH2 User range settings gain value	ļ
			214	CH3 User range settings offset value	
			215	CH3 User range settings gain value	
			216	CH4 User range settings offset value	ļ
			217	CH4 User range settings gain value	

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3.6 A62DA-S1 (Replacement to the Q62DAN)

3.6.1 Performance comparison

Item	A62DA-S1					
Digital input	0 to +4000					
Analog output	Voltage: 0 to +10VDC (External load resistance value: 500Ω to 1MΩ) Current: +4 to +20mADC (External load resistance value: 0Ω to 600Ω) *Current output is usable by 0 to +20mA.					
I/O characteristics	$ \begin{array}{ c c c c } \hline \text{Output range} & Digital input & Analog output \\ \hline \\ \hline \text{O to 10V} & + 4000 & + 10V \\ \hline \hline 0 & 0V \\ \hline 0 \text{ to 5V} & + 4000 & + 5V \text{ or } + 20\text{mA} \\ \hline 0 \text{ to 20mA} & 0 & 0V \text{ or 0mA} \\ \hline 1 \text{ to 5V} & + 4000 & + 5V \text{ or } + 20\text{mA} \\ \hline 1 \text{ to 5V} & + 4000 & + 5V \text{ or } + 20\text{mA} \\ \hline 4 \text{ to 20mA} & 0 & + 1V \text{ or } + 4\text{mA} \\ \hline \end{array} $					
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 accuracy (accuracy at maximum analo output value)	(Refer to *1.)					
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: 0 to +12V Current: 0 to +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	-					

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

Output 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 $55^{\circ}C$ (within ±1%)	±50mV	±50mV	±100mV	±0.2mA	±0.2mA

						e : compatible,	Δ . Partial change required, *. Incompatible
	Q6	2DAN				Compatibility	Precautions for replacement
		gned binary					
	rmal resolution					0	
High resol	tion mode: -122	288 to 1228	7, -16384 to 7	16383			
Voltage: -10 to 1	•			0			
Current: 0 to 20	nADC (External	load resista		U			
	m	resolution ode	High res mo				
Analog output r	ange Digital input		-				
	value	resolution		resolution			
0 to	0.0	1.25mV	0 to	0.416mV			
1 to	5V 4000	1.0mV	12000	0.333mV			
Voltage -10 to	-4000 to	2.5mV	-16000 to 16000	0.625mV		0	
User ra settir	•	0.75mV	-12000 to 12000	0.333mV			
0 to 2	010	5 µ A	0 to	1.66µA			
Current 4 to 2		4 μ A	12000	1.33µA			
User ra		1.5 <i>µ</i> A	-12000 to 12000	0.83 µ A			
Am	ient temperatur	e 25±5°C: v	within ±0.1%				
	(voltage: ±10m	V, current: :	±20µA)			0	
Amb	ent temperature					0	
	(voltage: ±30m	V, current: :	±60µA)				
	80µs	/channel				0	
	Voltage: ±12V						
	Current: 21mA					0	
	2 channels/module						
	Max. 10	0,000 times	3			0	
	Ava	ailable				0	

O : Compatible, \bigtriangleup : Partial change required, ×: Incompatible

analog output module replacement

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

analog output module replacement

 		, Δ : Partial change required, ×: Incompati
Q62DAN	Compatibility	Precautions for replacement
Between the I/O terminal and programmable controller power supply:		
photocoupler isolation	0	
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:	â	
500VAC, for 1 minute	0	
Between the I/O terminal and programmable controller power supply:	<u>_</u>	
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		1
(Sleeved solderless terminal cannot be used.)	×	
0.33A	0	
24VDC +20%, -15%	<u> </u>	
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.	0	0	 Refer to ("Analog output status combination list" in the Digital-Analog Converter Module User's Manual to check the execution status of output. 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 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.

3.6.3 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.

	A620	DA-S1		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/	
						• •	disable flag	
X2		Y2		X2		Y2	CH2 Output enable/ disable flag	
X3		Y3		X3	Not used	Y3	ŭ	
X4		Y4		X4		Y4		
X5		Y5		X5		Y5		
X6		Y6		X6		Y6	Not used	
X7		Y7		X7		Y7		
X8		Y8		X8	High resolution mode status flag	Y8		
X9		Y9		X9	Operating condition setting completion flag	Y9	Operating condition setting request	
XA		YA		×Δ	Offset/gain setting mode status flag	YA	User range write request	
XB		YB	Not used	XB	Channel change completion flag	YB	Channel change request	
хс		YC		XC	Setting value change completion flag	YC	Setting value change 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		Y11						
X12		Y12						
X13		Y13						
X14		Y14						
X15		Y15						
X16		Y16						
X17		Y17						
X18		Y18						
X19		Y19						
X1A		Y1A						
X1B	4	Y1B	Output enable					
X1C	4	Y1C						
X1D	4	Y1D	Not used					
X1E	-	Y1E						
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			Q62DAN		
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	R/W	
2	CH1 Upper limit check code		2	CH2 Digital value		
3	CH1 Lower limit check code	R/W	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	Б	
			12	CH2 Setting value check code	R	
			13			
			to	System area (Not used)	-	
			18			
			19	Error code	R	
			20	Setting range (CH1 to CH2)	ĸ	
	21 System area (Not used)		· · · ·	-		
			22	Offset/gain setting mode		
			22	Offset specification		
			23	Offset/gain setting mode	R/W	
			20	Gain specification		
			24	Offset/gain adjusted value specification		
			25			
			to	System area (Not used)	-	
			157			
			158	Mode switching setting	R/W	
			159			
			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 val			
			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		

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3.7 A62DA-S1 (Replacement to the Q64DAN)

3.7.1 Performance comparison

I	tem		A62DA-S	51				
Digital input		0 to +4000						
		Voltage: 0 to +10VDC			-			
Analog output		Current: +4 to +20mAI	•		Ω to 600Ω)			
		*Curren	t output is usable	e by 0 to +20mA.				
		Output range	Digital input	Analog output				
			+ 4000	+ 10V				
		0 to 10V	0	0V				
I/O characteris	stics	0 to 5V	+ 4000	+ 5V or + 20mA				
		0 to 20mA	0	0V or 0mA				
		1 to 5V	+ 4000	+ 5V or + 20mA				
		4 to 20mA	0	+ 1V or + 4mA				
		1 to 5V: 1mV (1/4000)						
	Voltage	0 to 5V: 1.25mV (1/4000)						
Maximum		0 to 10V: 2.5mV (1/4000)						
resolution		4 to 20mA: 4µA (1/4000)						
	Current		0 to 20mA: 5µA (1/4000)					
Overall accura	асу							
(accuracy at n	naximum analog	(Refer to *1.)						
output value)								
		Within 15ms/2 channels (same time for one channel)						
Maximum con	version speed	Note) Time from when the digital input is	s written to when	the specified analog	voltage (current) is reached			
			Voltage: 0 to	+12V				
Absolute maxi	mum output		Current: 0 to +					
		Note) Max. output voltag	e and current res	stricted by output pro	tection circuit			
Number of ana points	alog output		2 channels/m	odule				
1 · · · · ·	tes to E ² PROM		-					
Output short p			_					
						4		

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

Output 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 $55^{\circ}C$ (within ±1%)	±50mV	±50mV	±100mV	±0.2mA	±0.2mA

						e : eempaasie,	
		Q64 16-bit sig	Compatibility	Precautions for replacement			
Hig	(Normal) h resolution r	resolution	mode: -409	0			
-		•		ance value: 11 ance value: 0	,	0	
Analog	output range		esolution ode	High res mo	de		
Analog	output range	Digital input value	Maximum resolution	Digital input value	Maximum resolution		
	0 to 5V	0 to	1.25mV	0 to	0.416mV		
	1 to 5V	4000	1.0mV	12000	0.333mV		
Voltage	-10 to 10V	-4000 to	2.5mV	-16000 to 16000	0.625mV	0	
	User range settings	4000	0.75mV	-12000 to 12000	0.333mV		
	0 to 20mA	0 to	5 µ A	0 to	1.66µA		
Current		4000	4#A	12000	1.33µA		
	User range settings	-4000 to 4000	1.5 <i>µ</i> A	-12000 to 12000	0.83 µ A		
		temperature age: ±10m		vithin ±0.1% ±20µA)			
	Ambient te	-	0 to 55°C:	within ±0.3%		0	
		80µs/	channel	0			
		-	ge: ±12V nt: 21mA	0			
		4 channe	els/module	0			
 		Max. 100),000 times	;		0	
		Ava	ailable			0	

O : Compatible, \bigtriangleup : Partial change required, ×: Incompatible

analog output module replacement

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lte	em	A62DA-S1					
Isolation metho	d	Between the output terminal and programmable controller power supply: photocoupler isolation (Between channels: non-isolation)					
Dielectric withs	tand voltage	-					
Insulation resist	tance	-					
Number of occupied I/O points		32 points (I/O assignment: special 32 points)					
Connected term	ninal	20-point terminal block					
Applicable wire	size	0.75 to 2mm ² (Applicable tightening torque: 39 to 59N•cm)					
Applicable sold	erless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A					
Internal current (5VDC)	consumption	0.6A					
External	Voltage	21.6 to 26.4VDC					
power supply	Current consumption	0.35A					
	Inrush current	2.4A					
Weight		0.5kg					

analog output module replacement

 		, Δ : Partial change required, ×: Incompat
Q64DAN	Compatibility	Precautions for replacement
Between the I/O terminal and programmable controller power supply:		
photocoupler isolation	0	
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:	â	
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		1
(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	 Refer to ("Analog output status combination list" in the Digital-Analog Converter Module User's Manual to check the execution status of output. 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 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.

3.7.3 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.

Device No. Signal name No. Mot used Mot used Mot used Mot used Yi Chanple in able/ disable flag CHI Output enable/ disable flag CHI Output enable/ disable flag Yi CHI Output enable/ disable flag Yi CHI Output enable/ disable flag Yi Yi		A62[DA-S1		Q64DAN				
X1 D/A conversion READY Y1 X2 Y2 X3 Y2 X3 Y3 X4 Y4 X5 Y5 X6 Y6 Y7 Y8 Y9 Y9 XA Y4 X8 Y9 XA Y4 X8 Y8 Y9 Y9 XA YA XB YA XB YA Y1 CH1 Output enable/ disable flag X4 Y4 X5 Y6 Y7 Not used X8 Y8 Y9 Y4 XA YA XB YA XB YA Y1 Channel change Y8 Channel change Y8 Channel change YB X10 Y11 X11 Y11 X12 Y12			Device	Signal name			Device	Signal name	
X1 D/A conversion KEAUY Y1 X2 Y2 X3 Y2 X3 Y3 Y4 X2 X3 Y3 Y4 X2 X3 Y3 Y4 disable flag Y2 X2 X3 Y3 Y4 X2 X4 Y4 Y4 X4 Y4 X4 Y4 X4 Y4 X4 X5 Y5 X6 Y6 X7 Y7 X8 Y8 Y9 Y9 Y4 Y4 Y4 Status flag Y8 Y8 Y9 Y9 Y4 VA Y8 Operating condition mode status flag Y8 Y8 X9 Y8 Y2 Y8 Y4 User range write request completion flag X0 Y10 X11 Y11 Y12	X0	Watchdog timer error	Y0		X0	Module READY	Y0	Not used	
X2 Y2 X3 Y3 X4 Y4 X5 Y5 X6 Y6 Y7 Y6 Y6 Y7 X8 Y8 Y9 Y9 XA Y4 X8 Y8 Y9 Y9 XA YA X8 Y8 Y9 Y9 XA YA XB Y8 Y2 Y8 Y8 Y8 Y9 Y9 XA YA XB Y8 Y10 Y2 X11 Y11 X12 Y12 X13 Y13 X14 Y14 X15 Y15 X16 Y16 X17 Y17 X18 Y18 X11 Y11 X12 Y12 X13 Y13 X14 Y14 X15 Y16 X16 Y16 X17 Y17 X18 Y18 X19 Y19 X14 Y14 X15 Y16 X16 <td< td=""><td>X1</td><td>D/A conversion READY</td><td>Y1</td><td></td><td>X1</td><td></td><td>¥1</td><td></td></td<>	X1	D/A conversion READY	Y1		X1		¥1		
X2 Y2 disable flag X3 Y3 Y3 X4 Y4 X4 Y4 X5 Y6 X6 Y6 Y7 X6 Y8 Y8 Y9 Y8 Y9 Y9 XA YA Y8 Y8 Y9 Y8 Y9 Y9 XA YA Y4 Used X8 Y8 Y9 Y9 XA YA Y4 Used Y8 Y8 Y9 Y4 XB Y8 Y9 Y4 XA YA XB YA XC YC Y1 Y1 XD Y1 X11 Y11 X11 Y12 X13 Y13 X14 Y14 X16 Y16 X17 Y17 X18 Y18 X14 Y14 X15 Y16 X16 Y16 X17 Y17 X18 Y18 X16 Y16 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>									
X3 Y3 Y3 Y3 CH3 Output enable/ disable flag X4 Y4 Y4 Y4 X5 Y5 Y6 X7 Y6 Y7 X8 Y8 Y8 Y9 X4 Y4 X8 Y8 Y8 Y9 XA YA X8 Y8 Y8 Y9 XA YA X8 Y8 Y9 XA XA YA XB YA YB YA YA YA Y8 Y9 XA YA XB YA YB YA YA YA YA YA YB YA XA YA XB YB YC YA XB YB YA YB XA YB XB YB XB YB XE YE YF YF X10 Y10 X11 Y13 X12 Y12 X13 Y13 X14 Y14	X2		Y2		X2		Y2		
X3 Y3 X3 Not used Y3 disable flag X4 Y4 X4 Y4 X4 X5 Y5 Y6 Y7 X8 Y8 Y8 Y9 Y9 Y8 XA YA Y8 Y8 Y8 Y9 Y9 XA YA Y8 Y8 Y9 Y9 XA YA YA Y8 Y9 Y9 XA YA YA YA XB YA YA YA YA YA Y8 Y8 Y9 Y9 XA YA XA YA XB YB Not used YB Not used YC YC YC YC YC YF YF XD Y10 XE YE XF Y10 X111 Y11 X12 Y12 X13 Y13 X14 Y14 X15 Y16 X16 Y16 Y17		-						-	
X4 X4 X4 X4 X5 Y5 Y5 X6 Y6 X7 Y7 X8 Y8 X9 Y9 YA YA Y8 Y8 Y9 Y9 YA YA X8 Y8 Y9 Y9 YA YA YA YA X8 Y8 Y9 Y9 YA YA X4 YA X4 Y7 X8 Y8 Y9 Operating condition mode status flag Y0 Operating completion flag Y2 Operating completion flag YB Not used YD Y6 XC YC XE YE X10 Y10 X11 Y11 X12 Y12 X13 Y13 X14 Y18 X16 Y16 X17 Y18 Y18 Y18 Y19 Y18 Y10 Y18 Y11 Y18 Y12 Y12 Y13 Y18 <t< td=""><td>Х3</td><td></td><td>Y3</td><td></td><td>X3</td><td>Not used</td><td>Y3</td><td></td></t<>	Х3		Y3		X3	Not used	Y3		
X4 Y4 X4 Y4 disable flag X5 Y5 Y6 Y6 X7 Y7 X6 Y6 X8 Y8 Y8 Y8 X9 Y9 Y9 Y9 XA YA Y8 XB Y8 Y8 XB Y8 Y8 XA YA Y8 XA YA Y8 XA YA Y8 XA YA Y8 Y8 Y9 Operating condition mode status flag XA YA YA XB YB Not used XC YC YC XD Y0 Synchronous output request XD Y10 Y10 X11 Y11 X12 Y12 X13 Y13 X14 Y14 X15 Y16 X16 Y18 Y19 Y19 X14 Y14 X16 Y16 X17 Y17 X18 Y18 Y19 Y14 Y16 Y16 X16 Y16 X16 Y18 <								-	
X8 Y6 X7 X8 X8 Y7 X8 Y8 X9 Y9 XA YA XB YA XA YA XB YA YA YA YB YA YA YA YB YA YA YA YB YA YB YA YB Not used YC YC XD YB Not used YD XE YC XF YE XF YE X10 Y10 X11 Y12 X13 Y13 X14 Y16 X16 Y10 X16 Y10 X17 Y10 X18 Y18 X18 Y18 X14 Y18 X18 Y18 X14 Y18 X16 Y10 X16 Y10 X16 Y10 X16 Y10 X17 Y10 X18 Y18 X18 Y18 X18 </td <td>X4</td> <td></td> <td>Y4</td> <td></td> <td>X4</td> <td></td> <td>Y4</td> <td>•</td>	X4		Y4		X4		Y4	•	
X7 Y7 Y7 Not used X8 Y8 Y8 Y8 Y9 Y8 Y9 XA YA Y8 Y8 Y9 Operating condition setting mode status flag XB Y8 YA XB Y8 Not used Y0 Y0 Y8 Y10 Y10 X11 Y11 X12 Y12 X10 Y10 X11 Y11 X12 Y13 X14 Y14 X15 Y16 X16 Y16 X17 Y18 Y18 Y18 Y19 Y14 Y16 Y10 Y16 Y10 Y16 Y16 X16 Y16 X16 Y16 X16 Y16 Y10 Y16 Y10 Y16 Y110 Y16 Y12 Not used	X5		Y5				Y5		
X8 Y8 X9 Y9 XA Y9 XA YA YB YA YA YA YA YA YB YA YA YA YB YA YB YA YA YA YB YA YB YA YB YA YB YA YB YA YB YB YA YB YB YB YC YB YC YB YB Channel change change completion flag YB YB YD YB YE YF YTO Synchronous output mede flag YB YB YT11 Y11 X11 Y12 X13 Y13 X14 Y14 X15 Y16 X16 Y16 X17 Y17 X18 Y18 Y10 Y10 X11 Y12 X12 Y18 Y10 Y10 Y110 Y110 Y12			-						
X8 Y8 X8 status flag Y8 X9 Y9 Y9 Operating condition setting condition Y9 Operating condition setting request XA YA YA XA Offset/gain setting mode status flag YA User range write request XB YB Not used YB Channel change completion flag YB Channel change request XD YC YC Setting value change request YC Setting value change request XD YD YF YF Synchronous output mode flag YD X10 Y10 Y11 Y11 YF Synchronous output request X11 Y11 Y11 Y12 YF Error clear request X11 Y113 Y13 Y13 Y14 X16 Y16 Y16 Y16 Y16 X14 Y18 Y18 Output enable Y10 X11 Y11 Y11 Y11 Y11 X11 Y118 Y18 Not used	X7		Y7		X7		Y7	Not used	
X9Y9XAYAXBYAYBYAYBYAYBYAYBYAYBYAYBYBYCYCYCYCYCSetting value change completion flagYDYDYEYFYFYFY10Y10X11Y11X12Y12X13Y13X14Y14X15Y15X16Y16X17Y17X18Y18X10Y10X11Y11X12Y13X14Y14X15Y15X16Y16X17Y17X18Y18X10Y10X11Y11X12Y12X13Y13X14Y14X15Y15X16Y16X17Y17X18Y18X10Y10X11Y11Y12X13Y14Y15X16Y16X17Y17X18Y18X10Y10X11Y11Y11X12Y12X13X14Y15X16X16X17Y17X18Y17Y17Y17Y17Y17Y17Y17 <td>X8</td> <td></td> <td>Y8</td> <td></td> <td>X8</td> <td>status flag</td> <td>Y8</td> <td></td>	X8		Y8		X8	status flag	Y8		
XA YA Setting completion flag setting request XB YB Not used XA Offset/gain setting mode status flag YA User range write request XC YB YC YB Channel change completion flag YB Channel change request XD YD YD YD XC Setting value change completion flag YC Setting value change request XE YE YE YE YE Synchronous output mode flag YD Synchronous output mode flag YE Not used X10 Y10 Y11 Y11 Y12 XE Not used YE Error clear request X11 Y11 Y11 Y12 Y13 YE Fror clear request X11 Y13 Y13 Y13 Y14 Y14 X18 Y18 Y18 Output enable Y10 X14 Y18 Y18 Y10 Y10 X18 Y10 Y11 Y11 X18 Y10 Y10 Y11 X118 Y110 Y11 Y11 X118 Y110 Y11 Y11 X118 Y10 Y10 Y10 X10 Y10	X9		Y9		X9		Y9		
XA YA Va User range write request XB YB Not used XA status flag YA User range write request XC YC YB Not used XB Channel change completion flag YC Setting value change request XD YD YC YC Setting value change completion flag YC Setting value change request XE YE YF YF Synchronous output mode flag YD Synchronous output request XI1 Y11 Y11 Y11 YF Fror flag YF Error clear request X11 Y11 Y11 Y11 YF Error flag YF Error clear request X11 Y11 Y11 Y12 Y12 Y13 Y13 Y14 X14 Y14 Y14 Y14 Y14 Y15 YF Error flag YF Error clear request X11 Y13 Y13 Y13 Y14 Y16 Y16 Y16 Y16 X16 Y16 Y10 Y10 Y10 Not used Y10 Y10		-						setting request	
XB YB YB Channel change request XC YC YC Setting value change completion flag YC Setting value change request XD YD YD YD Synchronous output mode flag YD Synchronous output request XE YE YF YE YE XE Synchronous output mode flag YD Synchronous output request X10 Y10 Y10 Y10 Y10 YF Error flag YF Error clear request X11 Y11 Y11 Y11 Y11 YF Error flag YF Error clear request X11 Y11 Y12 Y13 Y13 Y14 Y14 Y15 YF X13 Y13 Y13 Y13 Y14 Y14 YF Error clear request X15 Y16 Y17 Y18 Y18 Y18 YF YF X16 Y18 Y18 Y18 YF YF YF X11 Y11 Y13 YF YF YF YF X16 Y16 Y16 Y16 YF YF YF X18 Y18 Y18 Y10 YF YF YF <tr< td=""><td>XA</td><td></td><td>YA</td><td></td><td>XA</td><td>status flag</td><td>YA</td><td>User range write request</td></tr<>	XA		YA		XA	status flag	YA	User range write request	
XC YC XD Not used YD YE YE YF Y10 X11 X12 X13 X14 X15 X16 X17 X18 X19 X10 X11 X12 Y13 Y14 Y15 Y16 Y17 Y18 Y19 X10 X11 Y11 Y12 Y13 Y14 Y15 Y16 Y17 Y18 Y19 Y11 Y12 Y13 Y14 Y15 Y16 Y17 Y18 Y110 Y111 Y12 Y13 Y14 Y15 Y16 Y17 Y18 Y110 Y111 Y12 Y13 Y14 Y15 Y16 Y17 Y18	ХВ		YB	Not used	XB	-	YB	Channel change request	
XDYDYDrequestXEYEYEYENot usedXFYFYI0YI0XENot usedX10Y10Y11Y11YI1X12Y12Y12X13Y13Y13X14Y14X15Y15X16Y16X17Y17X18Y18X19Y19X1AY1AX1BY1BX1CY1CX1DY1DX1EY1E	XC		YC		XC		YC		
XEYEXFYFX10Y10X11Y11X12Y12X13Y13X14Y14X15Y15X16Y16X17Y17X18Y18X19Y19X1AY18X11Y11X12Y12X13Y13X14Y14X15Y15X16Y16X17Y17X18Y18Y19Y14X10Y10X110Y10X110Y110X111Y111	XD	Not used	YD		XD		YD		
X10 Y10 X11 Y11 X12 Y12 X13 Y13 X14 Y14 X15 Y15 X16 Y16 X17 Y17 X18 Y18 X19 Y19 X1A Y1B X1C Y1C X1D Y1D X1E Y1E	XE		YE		XE		YE		
X11 Y11 X12 Y12 X13 Y13 X14 Y14 X15 Y15 X16 Y16 X17 Y17 X18 Y18 X19 Y19 X1A Y1B X1B Y1B X1C Y1C X1D Y1E	XF		YF		XF	Error flag	YF	Error clear request	
X12 Y12 X13 Y13 X14 Y14 X15 Y15 X16 Y16 X17 Y17 X18 Y18 X19 Y19 X1A Y1B X1B Y1C X1D Y11 X1E Y11									
X13 Y13 X14 Y14 X15 Y15 X16 Y16 X17 Y17 X18 Y18 X19 Y19 X1A Y1B X1B Y1B X1C Y1C X1D Y1E		-							
X14 Y14 X15 Y15 X16 Y16 X17 Y17 X18 Y18 X19 Y19 X1A Y1A X1B Y1B X1C Y1C X1D Y1E X1E Y1E									
X15 Y15 X16 Y16 X17 Y17 X18 Y18 X19 Y19 X1A Y1A X1B Y1B X1C Y1C X1D Y1E X1E Y1E									
X16 Y16 X17 Y17 X18 Y18 X19 Y19 X1A Y1A X1B Y1B X1C Y1C X1D Y1E X1E Y1E									
X18 Y18 X19 Y19 X1A Y1A X1B Y1B X1C Y1C X1D Y1D X1E Y1E									
X19 Y19 X1A Y1A X1B Y1B X1B Y1B X1C Y1C X1D Y1D X1E Y1E	X17		Y17						
X1A Y1A X1B Y1B Output enable X1C Y1C X1D Y1D X1E Y1E									
X1B Y1B Output enable X1C Y1C X1D Y1D X1E Y1E									
X1C Y1C X1D Y1D X1E Y1E Not used		4		Output analy-					
X1D Y1D X1E Y1E Not used		-							
X1E Y1E Not used									
		-		Not used					
	X1E 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)		Reau/write	(decimal)		Reau/write
0	CH1 Digital value		0	D/A conversion enable/disable	
1	CH2 Digital value		1	CH1 Digital value	
2	CH1 Voltage upper limit check code	R/W	2	CH2 Digital value	R/W
3	CH2 Voltage lower limit check code		3	CH3 Digital value	
4	CH1 Current upper limit check code		4	CH4 Digital value	
5	CH2 Current lower limit check code		5		
			to	System area (Not used)	-
			10		
			11	CH1 Setting value check code	-
			12	CH2 Setting value check code	R
			13	CH3 Setting value check code	
			14	CH4 Setting value check code	
			15		
			to	System area (Not used)	-
			18		
			19	Error code	R
			20	Setting range (CH1 to CH4)	
			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		
			160		
			to	System area (Not used)	-
			199	Description of the state of the second state o	D 44/
			200	Pass data classification setting	R/W
			201	System area (Not used)	-
			202	CH1 Industrial shipment settings offset value	-
			203 204	CH1 Industrial shipment settings gain value	
			204	CH2 Industrial shipment settings offset value	4
			205	CH2 Industrial shipment settings gain value	-
			206	CH3 Industrial shipment settings offset value CH3 Industrial shipment settings gain value	-
			207	CH3 Industrial shipment settings gain value CH4 Industrial shipment settings offset value	-
			208		-
			209	CH4 Industrial shipment settings gain value CH1 User range settings offset value	R/W
			210		-
			211	CH1 User range settings gain value CH2 User range settings offset value	-
			212		-
			213	CH2 User range settings gain value	-
				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	

Memo

3.8 A68DAI(-S1)

3.8.1 Performance comparison

lte	em	A68DAI (-S1)							
		(1)16-bit signed binary							
		(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					0 to 20mA	ADC			1
Analog output				(External loa	d resistance	value: 0Ω to 600)Ω)		
				Dic	ital value resol	lution	*Analog	1	
				1/4000	1/8000	1/12000	output value		
I/O characterist	tics		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				5.0µA				
resolution of	1/8000				2.5µA				
analog value	1/12000	1.6µA							
Overall accurat	су								
(accuracy at ma	aximum analog	±1.0% (±200µA)							
output value)									
Conversion spe	eed					ne time for one ch			
		Note) Time	from when	the digital inpu		when the specif	ied analog valu	le is reached	
Absolute maxir	num output		Note) I	Max. output cur	0 to +28r rent restricte	mA d by output prote	ection circuit		
Number of ana points	log output				8 channels/n	nodule			

21mA

8 channels/module

Q68DAIN Compatibility Precautions for replacement 16-bit signed binary (Normal resolution mode: -4096 to 4095, Ο High resolution mode: -12288 to 12287) 0 to 20mADC 0 (External load resistance value: 0Ω to 600Ω) Normal resolution High resolution mode mode Analog output range Digital Maximum Digital input Maximum input value resolution value resolution 0 to 20mA 5µA 1.66µA 0 to 4000 0 to 12000 4 to 20mA 4µA 1.33µA Ο Current -4000 to User range -12000 to 1.5µA 0.83µA settings 4000 12000 Ambient temperature 25±5°C: within ±0.1% (±20µA) Ο Ambient temperature 0 to 55°C: within ±0.3% (±60µA) 80µs/channel 0

0

0

O : Compatible, \bigtriangleup : Partial change required, ×: Incompatible

lte	em	A68DAI (-S1)				
Number of writes to E ² PROM		-				
Output short pr		-				
Isolation metho		Between the output terminal and programmable controller power supply: photocoupler isolation (Between channels: non-isolation)				
Dielectric withs	tand voltage	-				
Insulation resis	tance	-				
Number of occu	upied I/O points	32 points (I/O assignment: special 32 points)				
Connected term	ninal	38-point terminal block				
Applicable wire	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)	consumption	0.15A				
Futernal	Voltage	21.6 to 26.4VDC				
External power supply	Current consumption	0.4A				
	Inrush current	-				
Weight		0.65kg				

analog output module replacement

		: Partial change required, ×: 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	0	
Between output channels: non-isolation	U	
Between external power supply and analog output: transformer isolation		
Between the I/O terminal and programmable controller power supply: 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	×	Wiring change is required.
FG terminal: R1.25-3, 1.25-YS3, RAV1.25-3, V1.25-YS3A		
Terminals other than FG: R1.25-3	×	
(Sleeved solderless terminal cannot be used.)		
0.38A	Δ	The recalculation of internal curren consumption (5VDC) is required.
24VDC +20%, -15%		
Ripple, spike 500mVp-p or less		
0.27A	0	
2.5A, 230µs or less	-	
0.20kg	0	

3.8.2 Functional comparison

				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	 On Q68DAIN, the setting of HOLD/CLEAR is carried out for each channel. For the Q68DAIN, 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	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 D/A conversion enable/disable Enable Disable Combin ation CH Output enable/disable Enable Disable Analog output test Allowed Not allowed	-	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.

	A68DA	AI (-S1)		Q68DAIN				
Device	Signal name	Device	Signal name	Device	Signal name	Device	Signal name	
No.		No.	orginal namo	No.		No.		
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 CH2 Output enable/	
X2	Error flag	Y2		X2		Y2	disable flag	
							CH3 Output enable/	
X3		Y3		X3		Y3	disable flag	
X4		Y4		X4	Not used	Y4	CH4 Output enable/	
		14		74		14	disable flag	
X5		Y5		X5		Y5	CH5 Output enable/	
							disable flag	
X6		Y6	N a f a cara a d	X6		Y6	CH6 Output enable/	
			Not used				disable flag CH7 Output enable/	
X7		Y7		X7		Y7	disable flag	
					High resolution mode		CH8 Output enable/	
X8		Y8		X8	status flag	Y8	disable flag	
×0		2/0		VO	Operating condition	2/0	Operating condition	
X9		Y9		X9	setting completion flag	Y9	setting request	
ХА		YA		ХА	Offset/gain setting mode	YA	User range write request	
				701	status flag	17.	ober runge white request	
ХВ		YB		XB	Channel change	YB	Channel change request	
					completion flag			
XC	Not used	YC		XC	Setting value change completion flag	YC	Setting value change request	
			Interlock signal for the		Synchronous output		Synchronous output	
XD		YD	RFRP and RTOP	XD	mode flag	YD	request	
XE		YE	instructions when the	XE	Not used	YE	Not used	
XF		YF	A68DAI(-S1) is used in	XF	Error flog	YF	Error cloor request	
			remote I/O station	ΛΓ	Error flag	IF	Error clear request	
X10		Y10						
X11		Y11						
X12 X13		Y12 Y13						
X13 X14		Y14	D/A conversion output enable flag					
X14 X15		Y15	chabic hay					
X16		Y16						
X17		Y17						
X18		Y18	Error reset flag					
X19		Y19						
X1A		Y1A						
X1B	4	Y1B						
X1C	Interleck signal for the	Y1C	Notwood					
X1D X1E	Interlock signal for the RFRP and RTOP	Y1D Y1E	Not used					
A IE	instructions when the	I IC						
X1F	A68DAI(-S1) is used in	Y1F						
	remote I/O station							
	1							

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	Name	Read/write	Address	Name	Read/write	
(decimal)	Name	Reau/write	(decimal)	Name	Reau/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	10.00	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 (Nat 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		13	CH3 Setting value check code		
14	CH5 Setting value check code	R	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	alue check code 17 CH7 Setting value check				
			18	CH8 Setting value check code		
			19	Error code		
			20	Setting range (CH1 to CH4)		
			21	Setting range (CH5 to CH8)		
			00	Offset/gain setting mode		
			22	Offset specification		
			00	Offset/gain setting mode	R/W	
			23	Gain specification		
			24	Offset/gain adjusted value specification	-	
			25			
			to	System area (Not used)	-	
			157			
			158		B 844	
			159	Mode switching setting	R/W	
			160		1	
			to	System area (Not used)	-	
			201			
			202	CH1 Industrial shipment settings offset value	1	
			203	CH1 Industrial shipment settings gain value		
			204	CH2 Industrial shipment settings offset value	1	
			205	CH2 Industrial shipment settings gain value	R/W	
			206	CH3 Industrial shipment settings offset value	1	
			207	CH3 Industrial shipment settings gain value	1	
					1	

Q68DAIN						
Address (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					

3.9 A68DAV

3.9.1 Performance comparison

Digital input (1)16-bit signed binary (2)Setting range: Digital input <u>Setting resolution</u> <u>Setting resolution</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u> <u>10000</u>	lt	em				A68DAV				
Digital input Setting resolution Setting range Analog output 10 to 0 to 100 VDC 3000 to 4000 3000 to 4000 Analog output 10 to 0 to 100 VDC (External load resistance value: 2kQ to 11(0))		<u> </u>	(1)16-bit signed binary							
Image: second			(2)Setting range:	-						
Image: second										
Image: market in the second	Digital input			:						
Analog output -100 to 10 to 100/DC (External load resistance value: 2k() to 1M(0)) I/O characteristics										
Analog output 10 to 0 to 10VDC (External load resistance value: 24(3 to 1M(3)) I/O characteristics Image: state of the second of th										
Analog output (External load resistance value: 2kΩ to 1MΩ) I/O characteristics Image: analog and the second of the sec								12000		
I/O characteristics Image: transmitter in the image: transmitter in theim in theimage: transmitter in the image: transmitter in the im	Analog output									
UO characteristics Image: Control or					(External load	d resistance va	lue: 2kΩ to 1M	ΛΩ)		
UO characteristics Image: Control or										
UO characteristics Impute polititie 4000 8000 12000 +10V Digital input value 0 </td <td></td> <td></td> <td></td> <td></td> <td>Dig</td> <td>ital value resolut</td> <td>ion</td> <td>*Analog</td> <td>]</td> <td></td>					Dig	ital value resolut	ion	*Analog]	
UO characteristics Digital input value 2000 4000 6000 +5V Maximum resolution of analog value 1/4000 - 0					1/4000	1/8000	1/12000	output value		
Impati value 0 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>										
value value <th< td=""><td>I/O characteris</td><td>tics</td><td></td><td>-</td><td></td><td></td><td></td><td></td><td>_</td><td></td></th<>	I/O characteris	tics		-					_	
Image: state in the				-					-	
Image: Second				value					-	
Maximum 1/4000 2.5mV resolution of analog value 1/4000 1.25mV Overall accuracy 0.83mV 0 Querall accuracy ±1.0% (±100mV) 0 Overall accuracy ±1.0% (±100mV) 0 Conversion speed Within 40ms/8 channels (same time for one channel) Note) Time from when the digital input is written to when the specified analog value is reached -12 to +12V Absolute maximum output Note) Time from when the digital input is written to when the specified analog value is reached -12 to +12V Number of analog output points 8 channels/module - Number of writes to E ² PROM - - Output short protection - - Output short protection - - Isolation method Between the output terminal and programmable controller power supply: photocoupler isolation (Between channels: non-isolation) - Dielectric withstand voltage - - - Number of occupied I/O points (I/O assignment: special 32 points) - Connected terminal 38-point terminal block - Applicable wire size (Applicable tightening torque: 39 to 59N+cm) - Applicable					1 1				J	
resolution of analog value 1/12000 1.25mV 0.83mV 0.083mV 0.084mV 0.085mV 0.084mV 0.085mV 0.084mV 0.085mV 0.084mV 0.085mV 0.084mV 0.085mV 0.085mV 0.084mV 0.085mV 0.085mV 0.084mV 0.085mV 0.085mV 0.084mV 0.085mV 0.085mV 0.085mV 0.085mV 0.085mV 0.085mV 0.085mV 0.085mV 0.084mV 0.085mV 0.085mV 0.084mV 0.085mV 0.085					*When offset v		value 10V sett	tings		
analog value 1/12000 0.83mV Overall accuracy (accuracy at maximum analog output value) ±1.0% (±100mV) Conversion speed Within 40ms/8 channels (same time for one channel) Note) Time from when the digital input is written to when the specified analog value is reached Absolute maximum output -12 to +12V Number of analog output points 8 channels/module Number of writes to E ² PROM - Output short protection - Isolation method Between the output terminal and programmable controller power supply: photocoupler isolation (Between channels: non-isolation) Dielectric withstand voltage - Insulation resistance - Number of occupied I/O points (I/O assignment: special 32 points) (I/O assignment: special 32 points) Connected terminal 38-point terminal block Applicable solderless terminal V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A Internal current consumption 0.15A										
Overall accuracy (accuracy at maximum analog output value) ±1.0% (±100mV) Conversion speed Within 40ms/8 channels (same time for one channel) Note) Time from when the digital input is written to when the specified analog value is reached -12 to +12V Absolute maximum output -12 to +12V Number of analog output points 8 channels/module Number of writes to E ² PROM - Output short protection - Isolation method Between the output terminal and programmable controller power supply: photocoupler isolation (Between channels/ non-isolation) Dielectric withstand voltage - Insulation resistance - Number of occupied I/O points 32 points (I/O assignment: special 32 points) Connected terminal 0.75 to 2mm ² (Applicable wire size Applicable solderless terminal V1.25-3, V1.25-YS3A, V2-YS3A										
(accuracy at maximum analog output value) ±1.0% (±100mV) Conversion speed Note) Time from when the digital input is written to when the specified analog value is reached -12 to ±12V Absolute maximum output -12 to ±12V Number of analog output points & channels/module Number of writes to E ² PROM - Output short protection - Solution method Between the output terminal and programmable controller power supply: photocoupler isolation (Between channels: non-isolation) Dielectric withstand voltage - Number of occupied I/O points (I/O assignment: special 32 points) (I/O assignment: special 32 points) Connected terminal 0.75 to 2mm ² (Applicable solderless terminal Applicable solderless terminal V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	-			0.83mV						
output value) Mithin 40ms/8 channels (same time for one channel) Note) Time from when the digital input is written to when the specified analog value is reached Absolute maximum output -12 to +12V Absolute maximum output Note) Time from when the digital input is written to when the specified analog value is reached Number of analog output points 8 channels/module Number of writes to E ² PROM - Output short protection - Solation method Between the output terminal and programmable controller power supply: photocoupler isolation (Between channels: non-isolation) Dielectric withstand voltage - Insulation resistance - Number of occupied I/O points (I/O assignment: special 32 points) (I/O assignment: special 32 points) Connected terminal 0.7 5 to 2mm ² (Applicable solderless terminal Applicable solderless terminal V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A		•								
Conversion speed Within 40ms/8 channels (same time for one channel) Note) Time from when the digital input is written to when the specified analog value is reached Absolute maximum output -12 to +12V Note) Max. output voltage restricted by output protection circuit Number of analog output points 8 channels/module Number of writes to E ² PROM - Output short protection - Isolation method Between the output terminal and programmable controller power supply: photocoupler isolation (Between channels: non-isolation) Dielectric withstand voltage - Insulation resistance - Number of cocupied 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		aximum analog	±1.0% (±100mV)							
Conversion speed Note) Time from when the digital input is written to when the specified analog value is reached Absolute maximum output -12 to +12V Number of analog output points 8 channels/module Number of writes to E ² PROM - Output short protection - Isolation method Between the output terminal and programmable controller power supply: photocoupler isolation (Between channels: non-isolation) Dielectric withstand voltage - Insulation resistance - Number of occupied I/O points (I/O assignment: special 32 points) Connected terminal 0.75 to 2mm ² Applicable solderless terminal V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A Internal current consumption 0.15A	output value)		Within 40me/8 channels (same time for one channel)							
Absolute maximum output -12 to +12V Number of analog output points 8 channels/module Number of writes to E ² PROM - Output short protection - Isolation method Between the output terminal and programmable controller power supply: photocoupler isolation (Between channels: non-isolation) Dielectric withstand voltage - Insulation resistance - Number of occupied I/O points (I/O assignment: special 32 points) Connected terminal 0.75 to 2mm ² (Applicable wire size Applicable solderless terminal V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A Internal current consumption 0.15A	Conversion sp	eed								
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Number of writes to E ² PROM - Output short protection - Isolation method Between the output terminal and programmable controller power supply: photocoupler isolation (Between channels: non-isolation) Dielectric withstand voltage - Insulation resistance - Number of occupied I/O points (I/O assignment: special 32 points) Connected terminal 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		log output	8 channels/module							
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Insulation resistance - 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 2mm² (Applicable tightening torque: 39 to 59N•cm) Applicable solderless terminal V1.25-3, V1.25-YS3A, V2-YS3A 0 15A 0.15A	loolation moth	d	Between the output terminal and programmable controller power supply: photocoupler isolation							
Insulation resistance-Number of occupied I/O points32 points (I/O assignment: special 32 points)Connected terminal38-point terminal blockApplicable wire size0.75 to 2mm² (Applicable tightening torque: 39 to 59N•cm)Applicable solderless terminalV1.25-3, V1.25-YS3A, V2-S3, V2-YS3AInternal current consumption0.15A	Isolation metho	Ju	(Between channels: non-isolation)							
Insulation resistance-Number of occupied I/O points32 points (I/O assignment: special 32 points)Connected terminal38-point terminal blockApplicable wire size0.75 to 2mm² (Applicable tightening torque: 39 to 59N•cm)Applicable solderless terminalV1.25-3, V1.25-YS3A, V2-S3, V2-YS3AInternal current consumption0.15A										
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 tightening torque: 39 to 59N•cm) Applicable solderless terminal V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A Internal current consumption 0.15A	Dielectric withs	stand voltage	-							
Number of 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 0.15A	Insulation resis	stance								
Number of 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 0.15A										
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 0.15A	Number of occupied I/O points		·							
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 0.15A	Connected terminal									
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 0.15A					30					
Applicable solderless terminal V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	Applicable wire size									
Internal current consumption 0.15A		(Applicable tightening torque: 39 to 59N•cm)								
0.15A	Applicable solo	derless terminal			V1.25-3, V	1.25-YS3A, V2	2-S3, V2-YS3/	Ą		
(5VDC)	Internal curren	t consumption				0 154				
	(5VDC)					0.13A				

						: Partial change required, ×: Incompatible
		Q	68DAVN		Compatibility	Precautions for replacement
		16-bit s ormal resolution ition mode: -12	0			
	-10 to 10VD	C (External loa	d resistance v	/alue: 1kΩ to 1MΩ)	0	
 -	g output nge 0 to 5V 1 to 5V -10 to 10V User range settings	Normal reso Digital input value 0 to 4000 -4000 to 4000	Aution mode Maximum resolution 1.25mV 1.0mV 2.5mV 0.75mV	High resolution mode Digital input value Maximum resolution 0 to 12000 0.416mV -16000 to 16000 0.625mV -12000 to 12000 0.333mV	•	
		temperature 25 emperature 0 te	0			
		80µ	s/channel		0	
			±12V		0	
		8 chan	nels/module		0	
		Max. 10	00,000 times		0	
		A	vailable		0	
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					0	
		500VAC	, for 1 minute		0	
Bet	ween the I/O	terminal and p 500VDC,	0			
16 points (I/O assignment: intelligent 16 points)					Δ	The number of occupied I/O points has changed to 16 points.
		-	terminal block	κ	×	
	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 ved solderless	er than FG: R1	1.25-3	×	
	,		0.38A		Δ	The recalculation of internal current consumption (5VDC) is required.

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

	O : Compatible, \triangle	: Partial change required, ×: 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	
0.20kg	0	

3.9.2 Functional comparison

Item	Description	A68DA	V Q68DAVN	O : Available, - : Not available 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 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 conversion valu the offset value for each channel. The conversion speed stays constant regardless of whether D/A output is enabled or disabled.	e or	0	On Q68DAVN, 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 Synchronou output request (YD) is set to ON and the time specif 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 statio the analog output will not be synchronized because link scan delay if the synchronous output function is specified.	ed I -	0	
Analog output HOLD/ CLEAR function	Retains an analog value that was output when the programmable controller CPU is in the STOP status an error occurs.	or O	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	Outputs the analog value converted from a digital value when CH Output enable/disable flag is forcibly turn on while the programmable controller CPU is in the STOP status. String D/A conversion enable/disable Enable Disable CHD Output enable/disable Enable Disable CHD Output enable/disable Enable Disable CHD Output enable/disable Enable Disable Analog output test Allowed Not allowed	- -	0	
Resolution mode	Switches the resolution mode according to the application. The resolution can be selected from 1/4000, 1/12000 1/16000. The resolution mode is batch-set for all channels.), or	0	
Online module replacement	Replaces a module without stopping the system.	-	0	Replaceable modules during online are the Process CPU and the Redundant CPU.

3.9.3 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.

Device No. Signal name Device No. Signal name Device No. Signal name	Device	
No. No. No.		Signal name
	No.	
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 CH2 Output enable/
X2Error flagY2X2	Y2	disable flag
		CH3 Output enable/
X3 Y3 X3	Y3	disable flag
X4 Y4 X4 Not used	Y4	CH4 Output enable/
	14	disable flag
X5 Y5 X5	Y5	CH5 Output enable/
		disable flag
X6 Y6 X6	Y6	CH6 Output enable/
Not used		disable flag CH7 Output enable/
X7 Y7 X7	¥7	disable flag
High resolution mode		CH8 Output enable/
X8 Y8 X8 status flag	Y8	disable flag
Operating condition	2/0	Operating condition
X9 Y9 X9 setting completion flag	Y9	setting request
XA YA YA Offset/gain setting mode	YA	User range write request
status flag		User range while request
XB YB XB Channel change	YB	Channel change request
completion flag		
XC Not used YC XC Setting value change completion flag	YC	Setting value change request
Interlock signal for the Setting value change		Synchronous output
XD YD RFRP and RTOP XD completion flag	YD	request
XE YE instructions when the XE Not used	YE	Not used
XF YF A68DAV is used in XF Error flag	YF	Error cloar request
remote I/O station	IF	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		
X1B Y1B		
X1C Y1C X1D Interlock signal for the Y1D Not used		
X1D Interlock signal for the Y1D Not used		
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	Name	Read/write	Address	Name	Read/write	
(decimal)	Name	Read/write	(decimal)	Name	Read/write	
0	D/A conversion enable/disable channel		0	D/A conversion enable/disable	R/W	
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		
5	CH5 Digital value		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			
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		13	CH3 Setting value check code	R	
14	CH5 Setting value check code	R	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		
			19	Error code		
			20	Setting range (CH1 to CH4)		
			21	Setting range (CH5 to CH8)		
			00	Offset/gain setting mode		
			22	Offset specification	R/W	
				Offset/gain setting mode		
			23	Gain specification		
			24	Offset/gain adjusted value specification		
		25				
			to	System area (Not used)		
			157			
			158	Mode switching setting R/W System area (Not used) -		
			159			
			160			
			to			
			201			
			202	CH1 Industrial shipment settings offset value		
			203	CH1 Industrial shipment settings gain value	1	
			204	CH2 Industrial shipment settings offset value	1	
			205	CH2 Industrial shipment settings gain value	R/W	
			206	CH3 Industrial shipment settings offset value	1	
			207	CH3 Industrial shipment settings gain value	1	
			208	CH4 Industrial shipment settings offset value	-1	

Q68DAVN						
Address (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					

Memo

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TEMPERATURE INPUT MODULE REPLACEMENT

4.1 List of Temperature Input Module Alternative Models for Replacement

Production di	iscontinuation		Transition to Q series
Product	Model	Model	Remarks (Restrictions)
	A616TD	Q64TD	 External wiring : Cable size is changed. Number of slots : Changed (4 modules are required when one A616TD and one A60MXT(N) are used.) Program : 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
	A60MXT(N)	Q68TD-G-H02 Q68TD-G-H01	1) External wiring : Connector wiring and cable size are changed. 2) Number of slots : Changed (2 modules are required when one A616TD and one A60MXT(N) are used.) 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: The disconnection detection function is equipped (only in the Q68TD-G-H02). Transformer isolation is provided between channels.
		Q64RD	 External wiring : Cable size is changed. Number of slots: : Changed (2 modules are required.) Program : 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	A68RD3N	Q64RD-G	 External wiring : Cable size is changed. Number of slots : Changed (2 modules are required.) Program : 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.
		Q68RD3-G	 External wiring : Connector wiring and cable size are changed. Number of slots : Not changed Program : 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.
		Q64RD	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: Not changed
	A68RD4N	Q64RD-G	 External wiring : Cable size is changed. Number of slots : Changed (2 modules are required.) Program : 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.

4.2 A616TD (Replacement to the Q64TD)

4.2.1 Performance comparison

(1) Performance comparison list

It	tem	A616TD (When using the A60MXT and A60MXTN together)	
Temperature s	sensor input	-200 to 1800°C	
	Digital output value	16-bit signed binary (0 to 4000) (Data part: 12 bits)	
Output	Detected temperature value	16-bit signed binary (-2000 to 18000: value up to the first decimal place × 10)	
Applicable the	rmocouple	Refer to Section 4.2.1 (2).	
Measured tem accuracy	perature range	Refer to Section 4.2.1 (2).	
Overall accura	2014	Refer to the table in Section 4.2.1 (2).	1
Overall accura	icy	Measured temperature range accuracy ±0.5°C	
Maximum conv	version speed	50ms/channel	
Isolation metho		Between the input terminal and programmable controller power supply: photocoupler isolation Between channels: non-isolation (1MΩ resistor isolation)	
Number of tem input points	nperature sensor	15 points/module (A60MXT, A60MXTN) (The A60MXT and A60MXTN can be mounted up to seven in total to one A616TD.)	
	cupied I/O points	32 points (I/O assignment: special 32 points)	
External conne	ection system	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)	nt consumption	1.0A	
Weight		0.85kg	
*1		accuracy in the following method	

*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±5°C range.

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

				O: Compatible,	\triangle : Partial change required, ×: Incompatible
	C	Q64TD		Compatibility	Precautions for replacement
	-270	to 1820°C		0	
16-	bit signed bi	inary (Scaling value	e)	0	
(-2700 to 1820		igned binary to the first decima	l place × 10)	0	
	Refer to So	ection 4.2.1 (2).		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.
	Refer to Se	ection 4.2.1 (2).		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.
	40m	s/channel		0	
Isolated area	Isolation method	Dielectric withstand voltage	Insulation resistance		
Between thermocouple input and earth	Transformer isolation	1780VrmsAC/3 cycles	500VDC 100M Ω or more		
Between thermocouple input channels	Transformer isolation	(altitude 2000m)	500VDC 10MΩ or more	0	
Between cold junction compensation input (Pt100) and ground	Non-isolation	-	-		
	4 chan	nels/module		×	Consider replacement with multiple Q64TD.
(1/0		6 points : intelligent 16 poin	ts)	 Δ	The number of occupied I/O points has changed to 16 points.
	18-point	terminal block		×	
		0.75mm ²		×	Wiring change is required.
 (Sleeved		3, R1.25-3 terminal cannot be	used.)	×	
		0.50A		0	
	C).25kg		 0	

(2) Applicable thermocouple and measured temperature range accuracy

				A616TD				
				Measurement range	1	2	3	4
JIS	ANSI	DIN	BS	number		2	3	4
515	ANSI	DIN	BS	Allowable input voltage	-12.5 to 12.5	0 to 25	0 to 50	0 to 100
				range [mV]	-12.5 (0 12.5	01025	01030	010100
				Measured temperature	100 to 1500	100 to 1800	100 to 1800	100 to 1800
В	В	_	PtRh30-	range [°C]	100 10 1000	100 10 1000	100 10 1000	100 10 1000
D	D		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]	0101000	0101100	0101700	0101100
			1 adrio 1 t	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]	0101200	0.0 1100		0.0 1100
U	Ũ		1 4 4 1 0 1 0	Accuracy at 25°C [%]	_	±0.4	_	_
				Temperature drift [%/°C]		±0.011		
				Measured temperature	-200 to 250	0 to 500	0 to 1000	0 to 1300
К	к	NiCr-Ni	NiCr-NiAl	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
				Measured temperature	-200 to 150	0 to 300	0 to 600	0 to 1000
Е	Е	_	NiCr-CuNi	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 800	0 to 1200
J	J	-	Fe-CuNi	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]				
				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	-
		<u> </u>		Temperature drift [%/°C]		±0.01	±0.011	

4 TEMPERATURE INPUT MODULE REPLACEMENT

			Q64TD		
JIS			Specifications		
	Measured temperature	0 to 600	600 to 800	800 to 1700	1700 to
	range [°C]	0 10 600	600 10 800	800 10 1700	1820
P	Conversion accuracy at		12.0	10.5	
В	25±0.5°C [°C]		±3.0	±2.5	
	Temperature characteristics	-			-
	[°C]		±0.4	±0.4	
	Measured temperature			000/ /000	1600 to
	range [°C]	-50 to 0	0 to 300	300 to 1600	1760
_	Conversion accuracy at				
R	25±0.5°C [°C]		±2.5	±2.0	
	Temperature characteristics	-			-
	[°C]		±0.4	±0.3	
	Measured temperature				1600 to
	range [°C]	-50 to 0	0 to 300	300 to 1600	1760
	Conversion accuracy at				
S	25±0.5°C [°C]		±2.5	±2.0	
	Temperature characteristics	-			-
	[°C]		±0.4	±0.3	
	Measured temperature				1200 to
	range [°C]	-270 to -200	-200 to 0	0 to 1200	120010
	Conversion accuracy at		Larger value of ±0.5°C, or ±0.5%	Larger value of ±0.5°C, or	1570
K	25±0.5°C [°C]		of measured temperature	±0.25% of measured temperature	
	Temperature characteristics	-	Larger value of ±0.06°C, or	Larger value of $\pm 0.06^{\circ}$ C, or	-
	-		•	-	
	[°C]		±0.2% of measured temperature	±0.02% of measured temperature	
	Measured temperature	-270 to -200	-200 to 0	0 to 900	900 to 100
	range [°C]				
_	Conversion accuracy at		Larger value of ±0.5°C, or ±0.5%	Larger value of ±0.5°C, or	
E	25±0.5°C [°C]		of measured temperature	±0.25% of measured temperature	
	Temperature characteristics	-	Larger value of ±0.06°C, or	Larger value of ±0.06°C, or	-
	[°C]		±0.15% of measured	±0.02% of measured temperature	
			temperature	· · · · · · · · · · · · · · · · · · ·	
	Measured temperature	-210 to -40	-40 to 750	750 to 1200	-
	range [°C]				
	Conversion accuracy at		Larger value of ±0.5°C, or		
J	25±0.5°C [°C]	-	±0.25% of measured	-	-
0	2010.0 0 [0]		temperature		
	Temperature characteristics		Larger value of ±0.06°C, or		
	•	-	±0.02% of measured	-	-
	[°C]		temperature		
	Measured temperature	070 1- 000	000 to 0	0.45.050	050 1- 40
	range [°C]	-270 to -200	-200 to 0	0 to 350	350 to 400
	Conversion ecourses at		Larger value of ±0.5°C, or ±0.5%	Larger value of ±0.5°C, or	
-	Conversion accuracy at		-		-
Т	25±0.5°C [°C]	-	of measured temperature	±0.25% of measured temperature	
Т			of measured temperature Larger value of ±0.06°C, or	±0.25% of measured temperature Larger value of ±0.06°C, or	
т	25±0.5°C [°C] Temperature characteristics	-		Larger value of ±0.06°C, or	-
Т	25±0.5°C [°C] 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	- 1250 to
Т	25±0.5°C [°C] Temperature characteristics [°C] Measured temperature	-270 to -200	Larger value of ±0.06°C, or	Larger value of ±0.06°C, or	
	25±0.5°C [°C] Temperature characteristics [°C] Measured temperature range [°C]	- -270 to -200	Larger value of ±0.06°C, or ±0.1% of measured temperature -200 to 0	Larger value of ±0.06°C, or ±0.02% of measured temperature 0 to 1250	- 1250 to 1300
T	25±0.5°C [°C] Temperature characteristics [°C] Measured temperature range [°C] Conversion accuracy at	-270 to -200	Larger value of ±0.06°C, or ±0.1% of measured temperature -200 to 0 Larger value of ±0.5°C, or ±0.5%	Larger value of ±0.06°C, or ±0.02% of measured temperature 0 to 1250 Larger value of ±0.5°C, or	
	25±0.5°C [°C] Temperature characteristics [°C] Measured temperature range [°C]	-270 to -200	Larger value of ±0.06°C, or ±0.1% of measured temperature -200 to 0	Larger value of ±0.06°C, or ±0.02% of measured temperature 0 to 1250	

4.2.2 Functional comparison

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.

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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	6TD			Q64	4TD	
Device No.		Device No.	Signal name	Device No.	Signal name	Device No.	Signal name
X0	Watchdog timer error	Y0		X0	Module READY	YO	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
X3	Disconnection error detection	Y3		X3	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 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		ХС	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	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 X1A		Y19 Y1A	Not used				
X1B		Y1B					
X1C		Y1C					
X1D	Interlock signal for the	Y1D					
X1E	RFRP and RTOP	Y1E					
V4F	instructions when the	V4F					
X1F	A616TD is used in remote I/O station	Y1F					
_				1			

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			Q64TD	
Address (hex)	Name	Read/write	Address (hex)	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		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	
	Detected temperature value out-of-range	5	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
	INPUT channel	_	34	CH3 Scaling value	
70 to 7F	Digital output value storage	R	35	CH4 Scaling value	
80 to FF	Error correction value setting		36 to 3D	System area (Not used)	
100 to 17F	Thermocouple type setting	R/W	3E	CH1 Scaling range lower limit value	
	MX CH.channel		3F	CH1 Scaling range upper limit value	
180 to 1FF	Digital output value storage	_	40	CH2 Scaling range lower limit value	
	MX CH.channel	R	41	CH2 Scaling range upper limit value	
200 to 27F	Detected temperature value storage		42	CH3 Scaling range lower limit value	R/W
	· · · ·	•	43	CH3 Scaling range upper limit value	-
			44	CH4 Scaling range lower limit value	
			45	CH4 Scaling range upper limit value	1
			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	1
			51	CH2 Scaling width upper limit value	1
			52	CH3 Scaling width lower limit value	1
			53	CH3 Scaling width upper limit value	R/W
			54	CH4 Scaling width lower limit value	1
			55	CH4 Scaling width upper limit value	1
			56	CH1 Warning output lower/lower limit value	1
				CH1 Warning output lower/upper limit value	-

Address (hex)NameRead/write58CH1 Warning output upper/lower limit value59CH1 Warning output upper/lower limit value5ACH2 Warning output lower/lower limit value5BCH2 Warning output lower/lower limit value5CCH2 Warning output lower/lower limit value5DCH2 Warning output lower/lower limit value5ECH3 Warning output lower/lower limit value60CH3 Warning output upper/lower limit value61CH3 Warning output lower/lower limit value62CH4 Warning output lower/lower limit value63CH4 Warning output lower/lower limit value64CH4 Warning output upper/lower limit value65CH4 Warning output upper/lower limit value66T5System area (Not used)-76CH1 Offset temperature setting value77CH4 Gain temperature setting value78CH3 Offset temperature setting value79CH2 Gain temperature setting value70CH4 Gain temperature setting value71CH4 Gain temperature setting value72CH4 Gain temperature setting value74CH3 Offset temperature setting value75FM offset value76CH1 User range settings offset value77CH4 Gain temperature setting value78CH3 CH3 Gain temperature setting value79CH2 Gain temperature setting value70CH4 Gain temperature setting value71CH4 Gain temperature setting value72CH4 User r		Q64TD	
59 CH1 Warning output lower/lower limit value 5A CH2 Warning output lower/lower limit value 5B CH2 Warning output upper/lower limit value 5C CH2 Warning output upper/lower limit value 5D CH2 Warning output lower/lower limit value 5E CH3 Warning output lower/lower limit value 60 CH3 Warning output upper/lower limit value 61 CH3 Warning output upper/lower limit value 62 CH4 Warning output lower/lower limit value 63 CH4 Warning output upper/lower limit value 64 CH4 Warning output upper/lower limit value 65 CH4 Warning output upper/lower limit value 66 to 75 System area (Not used) - 76 CH1 Offset temperature setting value 77 CH1 Gain temperature setting value 78 CH2 Gain temperature setting value 79 CH4 Gain temperature setting value 70 CH4 Gain temperature setting value 71 CH4 Gain temperature setting value 72 CH4 Gain temperature setting value 74 CH3 Offset temperature setting value 75 CH4 Gain temperature setting value		Name	Read/write
5A CH2 Warning output lower/lower limit value 5B CH2 Warning output upper/lower limit value 5C CH2 Warning output upper/lower limit value 5D CH2 Warning output lower/lower limit value 5E CH3 Warning output lower/lower limit value 60 CH3 Warning output lower/lower limit value 61 CH3 Warning output upper/lower limit value 62 CH4 Warning output upper/lower limit value 63 CH4 Warning output upper/lower limit value 64 CH4 Warning output upper/lower limit value 65 CH4 Warning output upper/lower limit value 66 to 75 57 CH1 Offset temperature setting value 76 CH1 Offset temperature setting value 77 CH1 Gain temperature setting value 78 CH2 Offset temperature setting value 79 CH2 Gain temperature setting value 70 CH4 Offset temperature setting value 71 CH4 Gain temperature setting value 72 CH4 Gain temperature setting value 74 CH3 Offset temperature setting value 75 CH4 User range settings offset value A0 CH1 Factory	58	CH1 Warning output upper/lower limit value	
5B CH2 Warning output lower/upper limit value 5C CH2 Warning output upper/lower limit value 5D CH2 Warning output lower/lower limit value 5E CH3 Warning output lower/lower limit value 60 CH3 Warning output upper/lower limit value 61 CH3 Warning output upper/lower limit value 62 CH4 Warning output lower/lower limit value 63 CH4 Warning output lower/lower limit value 64 CH4 Warning output lower/lower limit value 65 CH4 Warning output lower/lower limit value 66 CH4 Warning output upper/lower limit value 76 CH1 Offset temperature setting value 77 CH1 Gain temperature setting value 78 CH2 Gain temperature setting value 70 CH4 Gain temperature setting value 71 CH4 Gain temperature setting value 78 CH3 Gain temperature setting value	59	CH1 Warning output upper/upper limit value	
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AF EMF gain value (H) B0 CH3 Factory default offset value	AE	CH2 User range settings thermal (L)	
B0 CH3 Factory default offset value	AF		
Di Choraciory delauti galli 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	r/w
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)	1
BF	EMF gain value(H)	
C0	System area (Net used)	
to	System area (Not used)	-

Memo

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

4.3.1 Performance comparison

(1) Performance comparison list

Temperature sensor input -200 to 1800°C Output Digital output value 16-bit signed binary (0 to 4000) (Data part: 12 bits) Detected 16-bit signed binary (emperature value 16-bit signed binary (-2000 to 18000: value up to the first decimal place × 10) Applicable temperature value (-2000 to 18000: value up to the first decimal place × 10) Measured temperature range accuracy Refer to Section 4.3.1 (2). Overall accuracy Refer to the table in Section 4.3.1 (2). Measured temperature range accuracy Refer to the table in Section 4.3.1 (2). Overall accuracy Between the input terminal and programmable controller power supply: photocoupler isolation Between channels: non-isolation (1MΩ resistor isolation)	
Digital output value (0 to 4000) (Data part: 12 bits) Detected 16-bit signed binary temperature value (-2000 to 18000: value up to the first decimal place × 10) Applicable thermocouple Refer to Section 4.3.1 (2). Measured temperature range accuracy Refer to Section 4.3.1 (2). Overall accuracy Refer to the table in Section 4.3.1 (2). Maximum conversion speed 50ms/channel	
Output Detected (0 to 4000) (Data part: 12 bits) Detected 16-bit signed binary temperature value (-2000 to 18000: value up to the first decimal place × 10) Applicable thermocouple Refer to Section 4.3.1 (2). Measured temperature range accuracy Refer to Section 4.3.1 (2). Overall accuracy Refer to the table in Section 4.3.1 (2). Overall accuracy Refer to the table in Section 4.3.1 (2). Maximum conversion speed 50ms/channel	
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Measured temperature range accuracy Refer to Section 4.3.1 (2). Overall accuracy Refer to the table in Section 4.3.1 (2). Measured temperature range accuracy ±0.5°C Maximum conversion speed 50ms/channel	
accuracy Refer to Section 4.3.1 (2). Overall accuracy Refer to the table in Section 4.3.1 (2). Measured temperature range accuracy ±0.5°C Maximum conversion speed 50ms/channel	
accuracy Refer to the table in Section 4.3.1 (2). Overall accuracy Measured temperature range accuracy ±0.5°C Maximum conversion speed 50ms/channel Between the input terminal and programmable controller power supply: photocoupler isolation	
Overall accuracy Measured temperature range accuracy ±0.5°C Maximum conversion speed 50ms/channel Isolation method Between the input terminal and programmable controller power supply: photocoupler isolation	
Measured temperature range accuracy ±0.5°C Maximum conversion speed 50ms/channel Isolation method Between the input terminal and programmable controller power supply: photocoupler isolation	
Isolation method Between the input terminal and programmable controller power supply: photocoupler isolation	
Isolation method	
Disconnection detection Available	
Number of temperature sensor 15 points/module (A60MXT, A60MXTN)	
input points (The A60MXT and A60MXTN can be mounted up to seven in total to one A616TD.)	
Number of occupied I/O points 32 points (I/O assignment: special 32 points)	
External connection system 38-point terminal block	
External device connector	
(sold separately)	
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) 1.0A	

O : Compatible, \bigtriangleup : Partial change required, <code>x</code>: Incompatible

	Q series				e : eempatible,		
	Q68TD-G-H02	Q serie	s Q68TD-G-	H01 ^{*1}	Compatibility	Precautions for replacement	
		-270 to 182	20°C		0		
	16-bit s	signed binary (Scaling value)		0		
	(-2700 to 18200:	16-bit signed value up to the	0				
	Refer to Section 4.3.1 (2).					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).					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	Isolation method	Dielectric withstand voltage	Insulation resistance			
	Between thermocouple input and programmable controller power supply	Transformer isolation	AC500Vms/1min	DC500V 10MΩ or more			
	Between thermocouple input channels	Transformer isolation	AC1000Vrms/1min		0		
	Between cold junction compensation input (Pt100) and programmable controller power supply	Non-isolation	-	-			
	Available (all the channels are indepe	ndent)	Not avail	able	×	The Q68TD-G-H01 has the disconnection monitor function.	
	8 channels + c	hannels conne	ected to Pt100/modul	e	×	Consider replacement with multiple Q68TD-G-H02/H01.	
	(I/O ass	16 point ignment: intell	Δ	The number of occupied I/O points has changed to 16 points.			
		40-pin conn	×				
	A6CON4 0.3mm ² (22 AWG) or less					Wiring change is required	
						Wiring change is required.	
	-						
	0.65A		0.494		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 number	1	2	3	4
JIS	ANSI	DIN	BS	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			PtRh6	Accuracy at 25°C [%] Temperature drift [%/°C]		±0.5 ±0.013	-	-
R	R		PtRh13-Pt	Measured temperature range [°C]	0 to 1000	0 to 1700	0 to 1700	0 to 1700
ĸ	ĸ	-	PIRITS-PI	Accuracy at 25°C [%] Temperature drift [%/°C]		±0.4 ±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	5	FINI-FI	FIRITU-FI	Accuracy at 25°C [%] Temperature drift [%/°C]		±0.4 ±0.011	-	-
ĸ	K	K NiCr-Ni	liCr-Ni NiCr-NiAl	Measured temperature range [°C]	-200 to 250	0 to 500	0 to 1000	0 to 1300
ĸ	n.			Accuracy at 25°C [%] Temperature drift [%/°C]	±0.4 ±0.011	±0.3 ±0.01	±0.3 ±0.01	±0.5 ±0.013
	_	-	- NiCr-CuNi	Measured temperature range [°C]	-200 to 150	0 to 300	0 to 600	0 to 1000
E	E			Accuracy at 25°C [%]	±0.4	±0.3	±0.3	±0.4
				Temperature drift [%/°C] Measured temperature range [°C]	±0.011 -200 to 200	±0.01 0 to 400	±0.01 0 to 800	±0.011 0 to 1200
J	J	-	Fe-CuNi	Accuracy at 25°C [%] Temperature drift [%/°C]	±0.4	±0.3	±0.3	±0.4 ±0.011
				Measured temperature range [°C]	±0.011 -200 to 200	±0.01 0 to 400	±0.01 0 to 400	0 to 400
Т	Т	-	Cu-CuNi	Accuracy at 25°C [%] Temperature drift [%/°C]	±0.5 ±0.013	±0.3 ±0.01	-	-
				Measured temperature range [°C]	-100 to 200	0 to 400	0 to 800	0 to 900
-	-	Fe-CuNi	-	Accuracy at 25°C [%] Temperature drift [%/°C]	-	±0.3 ±0.01	±0.3 ±0.01	±0.5 ±0.013
				Measured temperature range [°C]	-100 to 200	±0.01 0 to 400	±0.01 0 to 600	0 to 600
-	-	Cu-CuNi	-	Accuracy at 25°C [%] Temperature drift [%/°C]	-	±0.3 ±0.01	±0.4 ±0.011	-

4 TEMPERATURE INPUT MODULE REPLACEMENT

MELSEC

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	±0.4°C	±13.0°C			
D	800 to 1700°C ^{*2}	±2.5°C	10.4 0	±12.5°C			
	1700 to 1820°C	*3	*3	*3			
	-50 to 0°C	*3	*3	*3			
R	0 to 300°C ^{*2}	±2.5°C	±0.4°C	±12.5°C			
ĸ	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			
ĸ	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			
Е	-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			
L	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			
Т	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			
Ν	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, \bigtriangleup : Partial change required, - : Not available				
Item	Description	A616TD	Q68TD-G- H02/H01	Precautions for replacement		
Temperature conversion function	Imports temperature data.	0	0			
Conversion enable/disable function	Sets whether to enable/disable a 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.		No.	orgnar name	No.		No.	oignaí naine	
X0	Watchdog timer error	Y0		X0	Module READY	Y0		
X1 X2	A/D conversion READY	Y1 Y2		X1 X2		Y1 Y2		
~2	Error flag Disconnection error	٢Z		~2		۲∠	-	
X3	detection	Y3		X3		Y3		
X4	Digital output value out-	Y4		X4		Y4		
74	of-range detection	14		A4	Not used	14	Not used	
	Detected temperature							
X5	value out-of-range	Y5		X5		Y5		
	detection	NC		XC		NC		
X6 X7	-	Y6 Y7		X6 X7		Y6 Y7	-	
X8		Y8	Not used	X8		Y8		
	-		Not used		Operating condition		Operating condition	
X9		Y9		X9	setting completion flag	Y9	setting request	
					Offset/gain setting mode			
XA		YA		XA	status flag	YA	User range write request	
XB		YB		ХВ	Channel change	YB	Channel change request	
					completion flag		Channel change request	
					Q68TD-G-H02:			
					Disconnection detection			
XC		YC		хс	signal	YC		
					Q68TD-G-H01:		Notwood	
					Disconnection status		Not used	
XD	-	YD	Interlock signal for the	XD	monitor signal Warning output signal	YD		
	-		RFRP and RTOP		Conversion completion		-	
XE	Not used	YE	instructions when the	XE	flag	YE		
XF		YF	A616TD is used in	XF	Error flag	YF	Error cloar request	
		TF	remote I/O station		Enormay	TF	Error clear request	
			Detected temperature					
X10		Y10	value LED display					
	-		request signal					
X11 X12	-	Y11 Y12						
X12 X13	4	Y12 Y13						
X13	1	Y14						
X15	1	Y15						
X16	1	Y16						
X17	1	Y17						
X18		Y18						
X19		Y19	Not used					
X1A	4	Y1A						
X1B	-	Y1B						
X1C X1D	Interlock signal for the	Y1C Y1D						
X1D X1E	RFRP and RTOP	Y1E						
	instructions when the							
X1F	A616TD is used in	Y1F						
	remote I/O station							
			1	1				

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.

(nc) Data format selection (nc) <		A6	16TD			Q68TD-G-H02, Q68TD-G-H01				
00 Data format selection PRW 01 Error code storage Chi to CH3 Time/count/moving average/ time constant setting RW 02 Error occurrence A60MXCIDCONNECT No. storage RW 09 System area (Not used) - 03 Thermocouple type setting error channel number storage R 0B to 12 CH1 to CH8 Time/count/moving average/ time constant setting R 04 Current sampling period storage R 0B to 12 CH1 to CH8 Measured temperature value R 05 to 0E System area (Not used) - 13 Error code R 05 to 0E System area (Not used) - 16 Setting range (Offset/gain setting) 1 10 to 17 System area (Not used) - 18 to 19 CH1 to CH8 Averaging processing selection 01 to 27 Soromection detection enable/ specification Af 16TD - 18 Offset/gain setting mode (Gain specification) - 28 to 2F System area (Not used) - - 18 Offset/gain setting mode (Cain specification) R 28 to 2F System area (Not used) - - 18 CG 10 CH8 Cain temperature setting value R/W 10 to 47 Discomection detection channel number storage R/W 22D CS System area (Not used		Na	ime	Read/write		Name	Read/write			
01 Error code storage Firor code storage Firor code storage Firor code storage 99 System area (Not used) - 03 Thermocouple type setting error channel number storage R 08 to 12 CH1 to CH8 Measured temperature value R 04 Current sampling period storage R 09 to 12 CH1 to CH8 Measured temperature value R 05 to 06 System area (Not used) - 13 Error code R 10 to 17 Glasble specification Multiplexer module R/W 14 to 15 CPU to CH8 Setting range (Offset/gain setting) - 10 to 17 System area (Not used) - 18 to 19 CH1 to CH8 Averaging processing selection 01 to 27 Discomection detection enable/disable R/W 1A Offset/gain setting mode (Gain specification) R/W 28 to 2F System area (Not used) - 18 010 cH1 Setting range (Not used) - 28 to 2F System area (Not used) - 18 Offset/gain setting mode (Gain specification) R/W 28 to 2F System area (Not used) - 10 CH1 GetT8 Chance storage R/W 28 to 5F		Data format selection				Conversion enable/disable setting				
02 Error occurrence A60MXEDCONNECT No. storage R/W 09 System area (Not used) - 03 Thermocouple type setting error channel number storage R/W 08 Conversion completion flag R 04 Current sampling period storage R 09 System area (Not used) - 13 Error code R 05 to 0E System area (Not used) - 13 Error code Ch11 to CH8 Measured temperature value R 06 to 02 Conversion enable/ disable specification A616TD R/W 14 to 18 CH1 to CH8 Measured temperature value - 19 to 17 System area (Not used) - 18 to 19 CH1 to CH8 Averaging processing selection - 19 to 17 System area (Not used) - 18 to 19 Offset/gain setting mode (Offset gancification) - 18 to 19 CH1 to CH8 Averaging processing selection R/W 20 to 27 System area (Not used) - 18 to 19 CH1 disan temperature setting value R/W 10 to 47 Disconnection detection channel number storage R/W 228 CH8 Gain tempera	01	Error code storage			01 to 08	CH1 to CH8 Time/count/moving average/	R/W			
storage Image: storage R OA Conversion completion flag 04 Current sampling period storage R 00 bto 12 CH1 to CH8 Measured temperature value R 05 to 0E System area (Not used) - 13 Error code R 06 to 10 Conversion enable/ A616TD Hto 15 CH1 to CH8 Measured temperature value R 07 Conversion enable/ A616TD Hto 15 CH1 to CH8 Measured temperature value R 10 to 17 System area (Not used) - 13 Setting range (Offset/gain setting mode (Offset spin setting mode (Offset specification) - 20 to 27 Disconnection detection enable/disable specification R/W 110 CH1 to CH8 Averaging processing selection - 20 to 27 System area (Not used) - 118 Offset/gain setting mode (Offset spin setting value R/W 30 to 37 Digital output value temperature setting R/W 110 CH1 Gain temperature setting value R/W 50 to 57 System area (Not used) - 20 CS System area (Not used) -	02	Error occurrence A60MXIICONNECT No.		R/W	09	-	_			
U3 number storage I UA Conversion completion flag 04 Current sampling period storage R 08 to 12 CH1 to CH8 Measured temperature value 05 to 05 System area (Not used) - 13 Error code R 06 to 17 Conversion enable/ A616TD Hto 15 CH1 to CH8 Setting range (Offset/gain setting) - 18 Setting data set request - 18 to 19 CH1 to CH8 Averaging processing selection - 19 to 17 System area (Not used) - 18 Offset/gain setting mode (Offset spin setting mode (Offset specification) - 20 to 27 Disconnection detection enable/disable specification R/W 10 Offset/gain setting mode (Offset spin setting mode (Offset specification) - 30 to 37 Digital output value temperature setting - 11B Offset/gain setting mode (Gain specification) R/W 48 to 47 System area (Not used) - - 12B CH4 Gain temperature setting value - 50 to 57 Digital output value temperature value out-of-range Channel number storage R/W 22E CH8 Gain temperature setting value - 68 to 6F System area (Not used) - - 20 Coffset/gain setting R/W 10 to 7F <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td>				-						
05 to 0E System area (Not used) - 13 Error code R 0F Conversion enable/ disable specification A616TD R/W 14 to 15 CH1 to CH8 Setting range (Thermocouple type) R 18 Setting data set request - 18 to 15 System area (Not used) - 18 to 16 Setting data set request - - 18 to 19 CH1 to CH8 Averaging processing selection 20 to 27 Disconnection detection enable/disable specification R/W 1A Specification - - 18 to 19 CH1 to CH8 Averaging processing selection 30 to 37 Digital output value temperature setting storage - 18 Offset/gain setting mode (Gain specification) R/W 40 to 47 System area (Not used) - 18 Offset/gain setting value R/W 50 to 57 Digital output value cot-of-range Channel number storage R/W 2D CH3 cain temperature setting value R/W 60 to 67 Detected temperature value out-of-range Channel number storage - 30 Warning output flag (Roces alarm) R 70 to 7F INPUT channel Digital output value storage - 30 G88TD G-H02:Disconn	03		etting error channel		0A	Conversion completion flag				
OF Conversion enable/ disable specification A616TD Multiplexer module RW 14 to 15 CH1 to CH8 Setting range (Thermocouple type) RW 18 Setting data set request - 18 to 19 CH1 to CH8 Averaging processing selection - 19 to 17 System area (Not used) - 18 to 19 CH1 to CH8 Averaging processing selection - 20 to 27 Specification R/W 1A Offset/gain setting mode (Gain specification) R/W 30 to 3F Digital output value temperature setting varage R/W 1C CH1 Offset temperature setting value R/W 48 to 4F System area (Not used) - 1B CH8 Gain temperature setting value R/W 50 to 57 Digital output value out-of-range Channel number storage R/W 22 CH8 Gain temperature setting value - 60 to 67 Detected temperature value out-of-range Channel number storage R/W 22E Warning output flag (Process alarm)) - 68 to 6F System area (Not used) - 30 30 Sating value - 70 to 7F INPUT channel Digital output	04	Current sampling peri	iod storage	R	0B to 12	CH1 to CH8 Measured temperature value				
0+ Conversion enable/ (able specification) Ref to 10 (Multiplexer module) 14 to 15 (multiplexer module) 14 to 15 (multiplexer module) 14 to 15 (multiplexer module) 16 (multiplexer module) 17 (multiplexer module) 18 (multiplexer module) 0ffset/gain setting mode (Gain specification) 18 (multiplexer module) 0 (multiplexer module) R/W 28 to 27 (multiplexer marker (Not used) - 10 (multiplexer module) - 10 (multiplexer module) R/W 20 (multiplexer m	05 to 0E	System area (Not use	ed)	-	13	Error code	R			
10 to 17 Orisable specification Nulliplexer module HVW 16 Setting range (Offset/gain setting) . 18 Setting data set request . 17 System area (Not used) . 20 to 27 Disconnection detection enable/disable specification R/W 1A Offset/gain setting mode (Offset specification) . 30 to 3F Digital output value temperature setting Disconnection detection channel number storage R/W 1C CH1 Offset/gain setting mode (Gain specification) R/W 48 to 4F System area (Not used) . 1B Offset/gain setting mode (Gain specification) R/W 50 to 57 Digital output value temperature setting channel number storage R/W 2B CH8 Gain temperature setting value R/W 58 to 5F System area (Not used) 60 to 67 Detected temperature value out-of-range Channel number storage R/W 2E Warning output faig (Process alarm) . . 68 to 6F System area (Not used) . . 30 Warning output faig (Rate alarm) . 68 to 6F System area (Not used) </td <td>0F</td> <td colspan="2"></td> <td>5.111</td> <td>14 to 15</td> <td></td> <td></td>	0F			5.111	14 to 15					
18 Setting data set request 17 System area (Not used) - 19 to 1F System area (Not used) - 18 to 19 CH1 to CH3 Averaging processing selection - 20 to 27 Disconnection detection enable/disable specification) R/W 1A Specification) - R/W 28 to 2F System area (Not used) - 1B Offset/gain setting mode (Gain specification) R/W 30 to 3F Digital output value temperature setting - 1B Offset/gain setting mode (Gain specification) R/W 40 to 47 Disconnection detection channel number storage R/W 1D CH1 Gain temperature setting value R/W 50 to 57 Digital output value out-of-range Channel number storage R/W 2B CH8 Gain temperature setting value R/W 58 to 5F System area (Not used) - - - 068TD-G-H02:Cold junction compensation setting state - 60 to 67 Detected temperature value out-of-range Channel number storage R/W 2E Warning output flag (Pate alarm) - 61 to 67 NPUT channel Digital output value storage R 30 Warning output flag (Rate alarm) -	10 to 17	disable specification	Multiplexer module	R/W	16					
19 to 1F System area (Not used) - 18 to 19 CH1 to CH8 Averaging processing selection 20 to 27 Disconnection detection enable/disable specification) R/W 1A Offset/gain setting mode (Offset specification) 30 to 37 Disconnection detection channel number storage - 1B Offset/gain setting mode (Gain specification) R/W 40 to 47 Disconnection detection channel number storage R/W 1C CH1 Offset temperature setting value R/W 50 to 57 Digital output value out-of-range Channel number storage R/W 2B CH8 Gain temperature setting value R/W 58 to 5F System area (Not used) - - 068TD-G-H02:Cold junction compensation setting state - - 60 to 67 Detected temperature value out-of-range Channel number storage R/W 2E Warning output flag (Process alarm) R 68 to 6F System area (Not used) - - 30 Warning output flag (Process alarm) R 70 to 7F INPUT channel R R 068TD-G-H01:Disconnection detection flag R 30 to FF Error correction value setting R 02 to 39 CH1 to CH8 Scaling value		Setting data set reque			17		-			
20 to 27 Disconnection detection enable/disable specification) R/W 1A Offset/gain setting mode (Offset specification) R/W 28 to 2F System area (Not used) - 1B Offset/gain setting mode (Gain specification) R/W 30 to 3F Digital output value temperature setting 0ffset/gain setting mode (Gain specification) R/W 1C CH1 Offset temperature setting value R/W 40 to 47 Disconnection detection channel number storage R/W 1D CH1 Gain temperature setting value R/W 50 to 57 Digital output value out-of-range Channel number storage R/W 2B CH8 Gain temperature setting value R/W 58 to 5F System area (Not used) - - 2D System area (Not used) - 58 to 5F System area (Not used) - - 2D System area (Not used) - 60 to 67 Detected temperature value out-of-range Channel number storage R/W 2E Warning output flag (Process alarm) R/W 70 to 7F INPUT channel Digital output value storage - 30 Warning output flag (Rate alarm) - 10t to 17F Termerocouple type setting R <t< td=""><td>19 to 1F</td><td>-</td><td></td><td>_</td><td>18 to 19</td><td></td><td></td></t<>	19 to 1F	-		_	18 to 19					
2016 2/1 specification RW IA specification) 28 to 2F System area (Not used) - 1B Offset/gain setting mode (Gain specification) RW 30 to 3F Digital output value temperature setting RW 1C CH1 Offset temperature setting value RW 40 to 47 Disconnection detection channel number storage RW 1C CH1 Gain temperature setting value R/W 50 to 57 Digital output value out-of-range Channel number storage R/W 2B CH8 Gain temperature setting value R/W 58 to 5F System area (Not used) - - 068TD-G-H02:Cold junction compensation Setting state R 60 to 67 Detected temperature value out-of-range Channel number storage R/W 2E Warning output fagl (Rate alarm) R 70 to 7F INPUT channel Digital output value storage R 31 068TD-G-H02:Disconnection detection flag GAB alarm) R 100 to 17F Thermocouple type setting RW 3A Scaling valu/(invalid setting RW 100 to 17F MC Channel Digital output value storage R 3F 32 to 39 CH1 Scaling range uper limit value RW		· · · · ·								
28 to 2F System area (Not used) - 1B specification) HW 30 to 37 Digital output value temperature setting N 1C CH1 Offset temperature setting value HW 40 to 47 Disconnection detection channel number storage RW 1D CH1 Gain temperature setting value R/W 48 to 4F System area (Not used) - to to CH3 Gain temperature setting value R/W 50 to 57 Digital output value out-of-range Channel number storage RW 2B CH8 Gain temperature setting value R/W 58 to 5F System area (Not used) - 2C System area (Not used) - 58 to 5F System area (Not used) - 2D G87D-G-H02:Cold junction compensation setting state R 60 to 67 Detected temperature value out-of-range Channel number storage RW 2E Warning output flag (Process alarm) R 70 to 7F INPUT channel R 31 G87D-G-H02:Disconnection detection flag G87D-G-H02:Disconnection status monitor flag monitor flag 31 G87D-G-H02:Disconnection status monitor flag 32 to 39 CH1 to CH8 Scaling valu//invalid setting R/W 100 to 17F INPUT channel	20 to 27			R/W	1A	specification)				
30 to 3F Digital output value temperature setting RW 1C CH1 Gain temperature setting value 40 to 47 Disconnection detection channel number storage RW 1D CH1 Gain temperature setting value 50 to 57 Digital output value out-of-range Channel number storage - - to 58 to 5F System area (Not used) - - - CH8 Gain temperature setting value RW 58 to 5F System area (Not used) - - 2B CH8 Gain temperature setting value RW 60 to 67 Detected temperature value out-of-range Channel number storage RW 2C System area (Not used) - 70 to 7F INPUT channel Digital output value storage R 2F Warning output flag (Rate alarm) R 100 to 17F INPUT channel Digital output value storage R 3A Scaling value R 30 to 157 Thermocouple type setting RW 3A Scaling value//rang output flag (Rate alarm) R 20 to 27F MX CH.channel Digital output value storage R 3A Scaling value//rang value/	28 to 2F	System area (Not use	ed)	-	1B		R/W			
40 to 47 Disconnection detection channel number storage R/W 1D CH1 Gain temperature setting value 48 to 4F System area (Not used) - to to 50 to 57 Digital output value out-of-range Channel number storage R/W 2C System area (Not used) - 58 to 5F System area (Not used) - 2D Q68TD-G-H02:Cold junction compensation setting state R 60 to 67 Detected temperature value out-of-range Channel number storage R/W 2E Warning output flag (Process alarm)) R 68 to 6F System area (Not used) - 30 Warning output flag (Process alarm)) R 70 to 7F INPUT channel Digital output value storage R 31 Q68TD-G-H01:Disconnection detection flag Q68TD-G-H01:Disconnection status monitor flag R 100 to 17F Thermocouple type setting R/W 3A Scaling value R/W 100 to 17F Thermocouple type setting R/W 3B to 3D System area (Not used) - 100 to 17F Thermocouple type setting R/W 3E CH1 to CH8 Scaling range upper limit value										
40 to 47 storage 1D CH1 Gain temperature setting value 48 to 4F System area (Not used) - to 50 to 57 Digital output value out-of-range Channel number storage RW 2B CH8 Gain temperature setting value R/W 58 to 5F System area (Not used) - 2B CH8 Gain temperature setting value R/W 60 to 67 Detected temperature value out-of-range Channel number storage R/W 2E Warning output flag (Process alarm) R/W 68 to 6F System area (Not used) - 3D Warning output flag (Rate alarm) R/W 70 to 7F INPUT channel Digital output value storage R/W 3A Scaling valu/invalid setting R/W 80 to FF Error correction value setting R/W 3A Scaling valu/invalid setting R/W 100 to 17F Thermocouple type setting R/W 3A Scaling range upper limit value R/W 200 to 27F MX CH.channel Digital output value storage R/W 3B to 3D System area (Not used) - 200 to 27F MX CH.channel Digital output value storage R/W 3E CH1 Scaling range upper limit value <	30 to 3F				1C	CH1 Offset temperature setting value				
50 to 57 Digital output value out-of-range Channel number storage R/W 2B CH8 Gain temperature setting value R/W 58 to 5F System area (Not used) - 2C System area (Not used) - 58 to 5F System area (Not used) - 2D Setting state - 60 to 67 Detected temperature value out-of-range Channel number storage R/W 2E Warning output flag (Process alarm) R/W 68 to 6F System area (Not used) - 30 Warning output flag (Rate alarm) R/W 70 to 7F INPUT channel Digital output value storage R R 31 G88TD-G-H01:Disconnection detection flag G88TD-G-H01:Disconnection status monitor flag R 80 to FF Error correction value setting R 31 G88TD-G-H01:Disconnection status monitor flag R 100 to 177 Thermocouple type setting R/W 3A Scaling valid/invalid setting R/W 120 to 27F MX CH.channel Digital output value storage R/W 3E CH1 Scaling range lower limit value R/W 200 to 27F MX CH.channel Digital output value storage R 3E CH1 Scaling width lower limit value R/W	40 to 47			R/W	1D	CH1 Gain temperature setting value				
50 to 57 Channel number storage R/W 2C System area (Not used) - 58 to 5F System area (Not used) - 2C System area (Not used) R 60 to 67 Detected temperature value out-of-range Channel number storage R/W 2E Warning output fag (Process alarm) R/W 68 to 6F System area (Not used) - 30 Warning output fag (Rote alarm) R/W 70 to 7F INPUT channel Digital output value storage R 31 068TD-G-H01: System area R R 80 to FF Error correction values setting R 31 068TD-G-H02:Disconnection detection flag R 100 to 17F Thermocouple type setting R/W 32 to 39 CH1 to CH8 Scaling value - - 200 to 27F MX CH.channel Digital output value storage R/W 3E CH1 Scaling range lower limit value R/W 200 to 27F MX CH.channel Detected temperature value storage R 3E CH1 Scaling range upper limit value R/W 4D CH8 Scaling range upper limit value K/W 4E CH1 Scaling width upper limit value R/W 5D CH8 Scaling wi	48 to 4F	System area (Not used)		-		to				
Channel number storage 2C System area (Not used) - 58 to 5F System area (Not used) - 2B Q68TD-G-H02:Cold junction compensation setting state R 60 to 67 Detected temperature value out-of-range Channel number storage R/W 2E Warning output enable/disable setting R/W 68 to 6F System area (Not used) - 30 Warning output flag (Process alarm) R 70 to 7F INPUT channel - 30 Warning output flag (Rate alarm) R 060 to 17 Thermocouple type setting R 2F Warning output flag (Rate alarm) R 80 to FF Error correction value setting R 31 Q68TD-G-H01:Disconnection detection flag R 100 to 17F Thermocouple type setting RW 34 Scaling valid/invalid setting R/W 180 to 1FF MX CH.channel Digital output value storage R 3E CH1 Scaling range lower limit value R/W 200 to 27F MX CH.channel Detected temperature value storage R 3E CH1 Scaling range upper limit value R/W 4E CH1 Scaling range upper limit value 4E CH1 Scaling width low	50 to 57	Digital output value or	ut-of-range	D/M	2B	CH8 Gain temperature setting value	R/W			
58 to 5F System area (Not used) - 2D setting state R 60 to 67 Detected temperature value out-of-range Channel number storage R/W 2E Warning output enable/disable setting R/W 68 to 6F System area (Not used) - 30 Warning output flag (Process alarm) R/W 70 to 7F INPUT channel Digital output value storage - 30 Warning output flag (Rate alarm) R 80 to FF Error correction value setting - 31 Q68TD-G-H02:Disconnection detection flag R 100 to 17F Thermocouple type setting R/W 31 Q68TD-G-H04:Scaling value R 100 to 17F Thermocouple type setting R/W 3A Scaling valid/invalid setting R/W 180 to 1FF MX CH.channel Digital output value storage R/W 3E CH1 Scaling range lower limit value R/W 200 to 27F MX CH.channel Detected temperature value storage R 3E CH1 Scaling range upper limit value R/W 4E CH1 Scaling width lower limit value R/W 4E CH1 Scaling width upper limit value R/W 5D CH8 Scaling width upper limit value R/W 5F CH1 Process alarm lower/lower limit value R/W	50 10 57	Channel number stora	age	10,00	2C	System area (Not used)	-			
58 to 5F System area (Not used) - 2D setting state Q68TD-G-H01: System area - 60 to 67 Detected temperature value out-of-range Channel number storage R/W 2E Warning output flag (Process alarm) R/W 68 to 6F System area (Not used) - 30 Warning output flag (Rate alarm) R/W 70 to 7F INPUT channel Digital output value storage R Q68TD-G-H01:Disconnection detection flag Q68TD-G-H01:Disconnection status monitor flag R 80 to FF Error correction value setting R/W 3A Scaling value R/W 180 to 1FF Thermocouple type setting R/W 3E CH1 Scaling range lower limit value R/W 200 to 27F MX CH.channel Digital output value storage R 3E CH1 Scaling range lower limit value R/W 200 to 27F MX CH.channel Detected temperature value storage R 4E CH1 Scaling range upper limit value R/W 4E CH1 Scaling range upper limit value to - 5D CH8 Scaling width lower limit value R/W 5E CH1 Process alarm lower/lower limit value 5F CH1 Process alarm lower/lower limit value R/W				-		Q68TD-G-H02:Cold junction compensation	D			
60 to 67 Detected temperature value out-of-range Channel number storage R/W 2E Warning output enable/disable setting R/W 68 to 6F System area (Not used) - 30 Warning output flag (Process alarm) R 70 to 7F INPUT channel Digital output value storage - 30 Warning output flag (Rate alarm) R 80 to FF Error correction value setting R 31 Q68TD-G-H01:Disconnection detection flag Q68TD-G-H01:Disconnection status monitor flag R/W 100 to 17F Thermocouple type setting R/W 3A Scaling valid/invalid setting R/W 180 to 1FF MX CH.channel Digital output value storage R/W 3B to 3D System area (Not used) - 200 to 27F MX CH.channel Detected temperature value storage R 3E CH1 Scaling range lower limit value R/W 4E CH1 Scaling range upper limit value R/W 4E CH1 Scaling width upper limit value R/W 5D CH8 Scaling width upper limit value to 5E CH1 Process alarm lower/lower limit value R/W	58 to 5F	System area (Not use	ed)		2D	setting state				
60 to 67 Channel number storage R/W 2F Warning output flag (Process alarm) 68 to 6F System area (Not used) - 30 Warning output flag (Rate alarm) 70 to 7F INPUT channel Digital output value storage - 30 Warning output flag (Rate alarm) R 80 to FF Error correction value setting R 31 Q68TD-G-H02:Disconnection detection flag Q68TD-G-H01:Disconnection status monitor flag R/W 80 to FF Error correction value setting R/W 3A Scaling valid/invalid setting R/W 100 to 17F Thermocouple type setting R/W 3B to 3D System area (Not used) - 180 to 1FF MX CH.channel Digital output value storage R 3E CH1 Scaling range lower limit value R/W 200 to 27F MX CH.channel Detected temperature value storage R 4E CH1 Scaling range upper limit value R/W 4E CH1 Scaling width lower limit value K/W 4E CH1 Scaling width lower limit value R/W 5D CH8 Scaling width upper limit value K/W 6E CH1 Process alarm lower/lower limit value F/W						Q68TD-G-H01: System area	-			
Channel number storage 2F Warning output flag (Process alarm) 68 to 6F System area (Not used) - 30 Warning output flag (Rate alarm) 70 to 7F INPUT channel Digital output value storage - 30 Warning output flag (Process alarm) R 80 to FF Error correction value setting R 31 Q68TD-G-H02:Disconnection detection flag Q68TD-G-H01:Disconnection status monitor flag R/W 100 to 17F Thermocouple type setting R/W 3A Scaling valid/invalid setting R/W 180 to 1FF MX CH.channel Digital output value storage R/W 3E CH1 Scaling range lower limit value R/W 200 to 27F MX CH.channel Detected temperature value storage R 4E CH1 Scaling range upper limit value R/W 4E CH1 Scaling width lower limit value R/W 4F CH1 Scaling width lower limit value R/W 4F CH1 Scaling width upper limit value R/W 4F CH1 Scaling width upper limit value R/W 5D CH8 Scaling width upper limit value R/W 6F CH1 Process alarm lower/lower limit value F/W	60 to 67	Detected temperature	e value out-of-range		2E	Warning output enable/disable setting	R/W			
70 to 7F INPUT channel Digital output value storage R 31 Q68TD-G-H01:Disconnection detection flag Q68TD-G-H01:Disconnection status monitor flag R 80 to FF Error correction value setting 32 to 39 CH1 to CH8 Scaling value R/W 100 to 17F Thermocouple type setting R/W 3A Scaling valid/invalid setting R/W 180 to 1FF MX CH.channel Digital output value storage R/W 3E CH1 Scaling range lower limit value R/W 200 to 27F MX CH.channel Detected temperature value storage R 3F CH1 Scaling range upper limit value R/W 4D CH8 Scaling width lower limit value to To To To 5D CH8 Scaling width upper limit value R/W To To To 5F CH1 Process alarm lower/lower limit value F/W To To TO	60 10 67	Channel number stora	age	R/W	2F	Warning output flag (Process alarm)				
70 to 7F INPUT channel Digital output value storage R 31 Q68TD-G-H01:Disconnection status monitor flag R 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 setting R/W 3B to 3D System area (Not used) - 180 to 1FF MX CH.channel Digital output value storage R 3F CH1 Scaling range lower limit value R/W 200 to 27F MX CH.channel Detected temperature value storage R 4E CH1 Scaling range upper limit value R/W 4E CH1 Scaling width lower limit value R/W 4F CH1 Scaling width upper limit value R/W 5D CH8 Scaling width upper limit value 5E CH1 Process alarm lower/lower limit value R/W	68 to 6F	System area (Not use	ed)	-	30	Warning output flag (Rate alarm)				
70 to 7F INPUT channel Digital output value storage R 31 Q68TD-G-H01:Disconnection status monitor flag 80 to FF Error correction value setting 32 to 39 CH1 to CH8 Scaling value R/W 100 to 17F Thermocouple type setting R/W 3A Scaling valid/invalid setting R/W 180 to 1FF MX CH.channel Digital output value storage R/W 3E CH1 Scaling range lower limit value R/W 200 to 27F MX CH.channel Detected temperature value storage R 3F CH1 Scaling range upper limit value R/W 4E CH1 Scaling width lower limit value K/W 4F CH1 Scaling width upper limit value R/W 4F CH1 Scaling width upper limit value F/W K/W 4F CH1 Scaling width upper limit value R/W 5D CH8 Scaling width upper limit value 5E CH1 Process alarm lower/lower limit value R/W						Q68TD-G-H02:Disconnection detection flag				
Digital output value storage monitor flag 32 to 39 CH1 to CH8 Scaling value 80 to FF Error correction value setting 100 to 17F Thermocouple type setting 180 to 1FF MX CH.channel Digital output value storage A 200 to 27F MX CH.channel Detected temperature value storage A 4D CH8 Scaling range upper limit value V 4F CH1 Scaling width upper limit value R/W 4E CH1 Scaling width upper limit value to 5E CH1 Scaling width upper limit value KW 4F CH1 Scaling width upper limit value R/W KW KW	70 40 75	INPUT channel	NPUT channel		31	Q68TD-G-H01:Disconnection status	ĸ			
80 to FF Error correction value setting R/W 3A Scaling valid/invalid setting R/W 100 to 17F Thermocouple type setting 3B to 3D System area (Not used) - 180 to 1FF MX CH.channel Digital output value storage 3F CH1 Scaling range lower limit value R/W 200 to 27F MX CH.channel Detected temperature value storage R 3F CH1 Scaling range upper limit value R/W 4D CH8 Scaling width lower limit value R/W 4E CH1 Scaling width lower limit value R/W 4F CH1 Scaling width upper limit value R/W 5D CH8 Scaling width upper limit value R/W 5E CH1 Process alarm lower/lower limit value R/W	70 l0 7 F	Digital output value st	orage	ĸ		monitor flag				
100 to 17F Thermocouple type setting R/W 3B to 3D System area (Not used) - 180 to 1FF MX CH.channel					32 to 39	CH1 to CH8 Scaling value				
100 to 17F Thermocouple type setting 3B to 3D System area (Not used) - 180 to 1FF MX CH.channel Digital output value storage 3F CH1 Scaling range lower limit value R/W 200 to 27F MX CH.channel 0 CH8 Scaling range upper limit value R/W 4D CH8 Scaling width lower limit value R/W 4E CH1 Scaling width lower limit value R/W 4F CH1 Scaling width upper limit value R/W 5E CH1 Process alarm lower/lower limit value R/W	80 to FF	Error correction value	setting		3A	Scaling valid/invalid setting	R/W			
180 to 1FF Digital output value storage R 3F CH1 Scaling range upper limit value R/W 200 to 27F MX CH.channel 4D CH8 Scaling range upper limit value R/W 4D CH8 Scaling range upper limit value R/W 4E CH1 Scaling width lower limit value R/W 4F CH1 Scaling width upper limit value R/W 5D CH8 Scaling width upper limit value R/W 5F CH1 Process alarm lower/lower limit value R/W	100 to 17F	Thermocouple type se	etting	R/W	3B to 3D	System area (Not used)	-			
Digital output value storage R 3F CH1 Scaling range upper limit value 200 to 27F MX CH.channel 4D CH8 Scaling range upper limit value Detected temperature value storage 4E CH1 Scaling width lower limit value R/W 4E CH1 Scaling width upper limit value R/W 5D CH8 Scaling width upper limit value SE CH1 Process alarm lower/lower limit value 5F CH1 Process alarm lower/upper limit value R/W		MX CH.channel			3E	CH1 Scaling range lower limit value	DAA			
200 to 27F MX CH.channel to 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 R/W 5D CH8 Scaling width upper limit value F 5E CH1 Process alarm lower/lower limit value R/W	180 to 1FF	Digital output value st	orage	_	3F	CH1 Scaling range upper limit value	R/W			
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 R/W 5D CH8 Scaling width upper limit value R/W 5E CH1 Process alarm lower/lower limit value R/W 5F CH1 Process alarm lower/lower limit value R/W	000 1- 075	MX CH channel		ĸ		to				
4F CH1 Scaling width upper limit value to to 5D CH8 Scaling width upper limit value 5E CH1 Process alarm lower/lower limit value 5F CH1 Process alarm lower/upper limit value	200 to 27F	Detected temperature	e value storage		4D	CH8 Scaling range upper limit value				
4F CH1 Scaling width upper limit value to to 5D CH8 Scaling width upper limit value 5E CH1 Process alarm lower/lower limit value 5F CH1 Process alarm lower/upper limit value				•	4E	CH1 Scaling width lower limit value	R/W			
5DCH8 Scaling width upper limit value5ECH1 Process alarm lower/lower limit value5FCH1 Process alarm lower/upper limit value					4F	CH1 Scaling width upper limit value				
5ECH1 Process alarm lower/lower limit value5FCH1 Process alarm lower/upper limit value						a	1			
5ECH1 Process alarm lower/lower limit value5FCH1 Process alarm lower/upper limit value					5D	CH8 Scaling width upper limit value				
5F CH1 Process alarm lower/upper limit value										
							R/W			
					60	CH1 Process alarm upper/lower limit value	1			

Q68TD-G-H02, Q68TD-G-H01									
Address (hex)	Name	Read/write							
61	CH1 Process alarm upper/upper limit value	R/W							
	to								
7D	CH8 Process alarm upper/upper limit value								
7E to 85	CH1 to CH8 Rate alarm warning detection								
7 - 10 00	period	R/W							
86	CH1 Rate alarm upper limit value	1							
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								
A4 to A5	disconnection detection								
A4 10 A5	Q68TD-G-H01:Disconnection state								
	conversion setting	R/W							
	Q68TD-G-H02:Conversion setting value for								
A6 to AD	disconnection detection								
A6 (0 AD	Q68TD-G-H01:Conversion setting value for								
	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							
C3	CH1 User range settings thermal EMF offset								
03	value (H)								
C4	CH1 User range settings thermal EMF gain								
64	value (L)								
C5	CH1 User range settings thermal EMF gain								
value (H)									
	to								
FC	CH8 User range settings thermal EMF gain								
FC	value (L)								
FD	CH8 User range settings thermal EMF gain	mal EMF gain R/W							
FD	value (H)								

Memo

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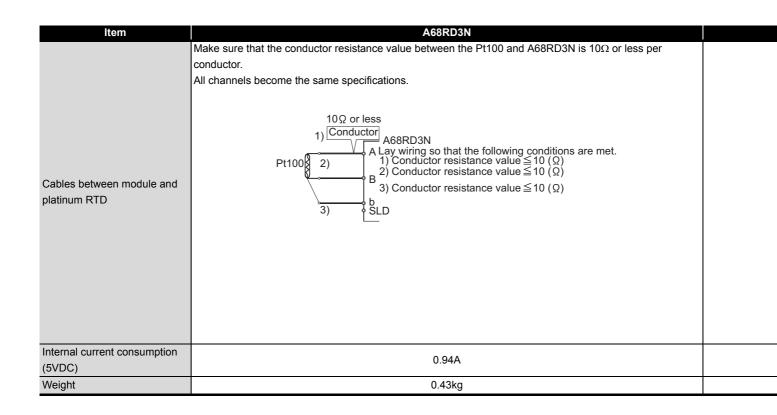
4.4 A68RD3N (Replacement to the Q64RD)

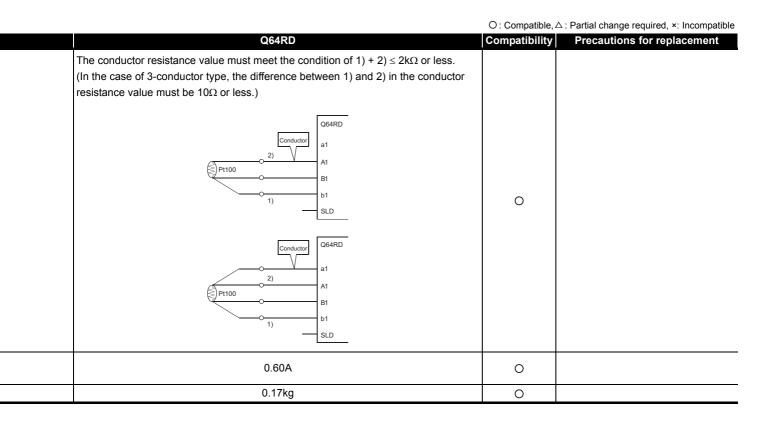
4.4.1 Performance comparison

lte	m	A68RD3N						
Measuring meth		3-wire type						
nicada	iou	16-bit signed binary						
		-1800 to 6000						
Output (tempera	ature	Value up to the first decimal place × 10						
conversion valu		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 platir	num RTD	JPt100						
		(JIS C1604-1981)						
Massurad	D#100	-180 to 600°C						
Measured	Pt100	(27.10 to 313.71Ω)						
temperature	JPt100	-180 to 600°C						
range	JPtiou	(25.80 to 317.28Ω)						
Accuracy		±1%						
Accuracy		(accuracy at full scale)						
Resolution		0.025°C						
Conversion spe	ed	40ms/channel						
Number of analog	og input points	8 channels/module						
Output current for detection	or temperature	1mA						
detection		Between platinum RTD input and programmable controller power supply: photocoupler isolation						
Isolation method	d	Between platinum RTD input and channel: non-isolation						
Dielectric withst		Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute						
Disconnection d	letection	Detected per channel						
Number of occu	inied I/O points	32 points						
Number of occu	ipieu i/O pointo	(I/O assignment: special 32 points)						
External connect	ction system	38-point terminal block						
Applicable wire	size	0.75 to 2mm ²						
Applicable solde	erless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A						

						\triangle : Partial change required, ×: Incompatible
	Q64F	RD			Compatibility	Precautions for replacement
	3/4-wire	type			0	
	16-bit signe -2000 to up to the first d 32-bit signe -200000 to p to the third de	0				
	Pt10 S C 1604-1997 JPt10 (JIS C 160		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 8 -180 to 6		0			
(accu Ambi	nt temperature iracy relative to ent temperature iracy relative to		0			
	0.025	°C			0	
	40ms/ch		0			
	4 channels/module					Consider replacement with multiple Q64RD.
	1m/	Ą			0	
Isolated area Between platinum RTD input and programmable controller power supply Between platinum RTD input and	Isolation method Photocoupler isolation	Dielectric withstand voltage 1780VrmsAC/3 cycles (altitude 2000m)	Insulation resistance 10MΩ or more using 500VDC insulation resistance tester		0	
channel			0			
	Detected per channel					
(I/O ;	16 points (I/O assignment: intelligent 16 points)					The number of occupied I/O points has changed to 16 points.
	18-point term				×	
	0.3 to 0.7				×	Wiring change is required.
(Sleeved	1.25-3, R solderless term	1.25-3 ninal cannot be use	ed.)		×	· - ·

O : Compatible, \bigtriangleup : Partial change required, ×: Incompatible





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.

X3 CH1: Disconnection detection flag Y3 cH2 Disconnection detection flag Y3 cH2 Offset setting request CH2 Offset setting request X5 CH2: Disconnection detection flag Y4 detection flag Y6 cH2 Ginsetting reque status signal Y4 cH2 Ginsetting reque status signal Y4 cH2 Ginsetting reque status signal X6 CH3: Disconnection detection flag Y6 cH4: Disconnection detection flag Y6 cH4: Offset setting request Y6 cH3 Ginsetting reque status signal X7 CH3: Disconnection detection flag Y7 detection flag Y8 cH4: Ginsetting reque status flag X8 CH4: Disconnection detection flag Y8 cH4 Ginsetting reque status flag X8 VD Interlock signal for the A68RD3N is used in Y11 X11 Y11 Not used Y12 cro code reset flag X111 X12 Not used Y14 Y13 X14 X15 Y16 Y16 Y16 X17 X16 HFRP and RTOP instructions when the A68RD3N is used in Y16 Y16 X17 X17 Y18 Y16 Y16 X17 X18 Y18 Y16 Y16 X17 X19 Interlock signal for the Y16 X16 X10 <th colspan="4">A68RD3N</th> <th colspan="4">Q64RD</th>	A68RD3N				Q64RD			
No. Watchdog timer error flag Y0 Not used X1 READY flag Y1 X2 Write data error flag Y1 X2 Write data error flag Y2 X3 CH1: Disconnection detection flag Y3 detection flag Y3 detection flag Y3 detection flag Y3 detection flag Y2 detection flag Y4 X5 CH2: Disconnection detection flag Y5 detection flag Y4 X4 CH4: Offset/gain setting request Y2 CH1 Gain setting reque status signal X6 CH2: Disconnection detection flag Y6 CH3: Offset setting request Y6 X7 CH5: Disconnection detection flag Y8 Y6 CH4 Gain setting reque X7 X8 CH2: Disconnection detection flag Y8 Y8 Y6 CH4 Gain setting reque X8 X0 CH6: Disconnection detection flag Y8 Y8 Y6 CH4 Gain setting request X8 Y2 Interlock signal for the remote I/O station X8 Not used Y8 X11 Y14 Y14 Y14 Y14 Y14		Signal name		Signal name		Signal name		Signal name
X1 READY flag Y1 X2 Write data error flag Y2 X3 CH1: Disconnection Y3 detection flag Y4 CH2: Disconnection Y4 detection flag Y4 X4 CH2: Disconnection X6 CH2: Disconnection X6 CH2: Disconnection X6 CH2: Disconnection X6 CH4: Disconnection X6 CH4: Disconnection X6 CH4: Disconnection X7 CH2: Disconnection detection flag Y7 X8 CH4: Disconnection X0 CH2: Disconnection detection flag Y8 detection flag Y8 X6 CH4: Disconnection detection flag Y8 XA CH4: Disconnection detection flag Y8 X6 YC X8 Y8 X9 Operating condition setting request XA XA CH4: Disconnection detection flag Y8 X6 YC X8 Y0 X9 Operating condition setting request XA XA								
X1 READ Triag Y1 request X2 Write date error flag Y2 CH2 Offset/gain setting detection flag Y2 CH1 Cain setting request X3 CH2 Disconnection detection flag Y3 CH2 Offset/gain setting request Y3 CH2 Offset/gain setting request Y3 X4 CH2: Disconnection detection flag Y6 CH2 Colorantection detection flag Y3 CH3 Offset/gain setting request Y4 CH2 Cain setting reque status signal X6 CH2: Disconnection detection flag Y7 CH3 Gain setting request Y6 CH3 Gain setting reque status flag X9 CH7: Disconnection detection flag Y8 Y4 Y4 CH2 Cain setting reque status flag X6 CH2: Disconnection detection flag Y8 Y8 Y4 CH4 Gain setting request X6 CH2: Disconnection detection flag Y8 Y8 V10 Y8 Y4 CH4 Gain setting request X6 CH2: Disconnection detection flag	70		ŤŬ					
X2 Write data error hag Y2 X3 CH1: Disconnection detection flag Y3 detection flag X4 CH2: Disconnection detection flag Y4 detection flag X6 CH2: Disconnection detection flag Y6 detection flag X6 CH3: Disconnection detection flag Y6 detection flag X7 CH4: Disconnection detection flag Y6 detection flag X8 CH6: Disconnection detection flag Y8 detection flag X9 CH6: Disconnection detection flag Y8 detection flag X8 YC X8 X0 CH2: Disconnection detection flag Y8 detection flag X0 V10 Interlock signal for the A68RD3N is used in request X10 Y10 Not used X11 Y10 X12 Not used X14 Y16 X14 Y16 X14 Y16 X14 Y16 X14 Y16 X16 Y16	X1	READY flag	Y1		X1		Y1	-
X3 detection flag Y3 request X4 CH2: Disconnection detection flag Y4 X5 CH3: Disconnection detection flag Y5 X6 CH4: Disconnection detection flag Y5 X6 CH4: Disconnection detection flag Y6 X7 CH5: Disconnection detection flag Y7 X8 CH4: Disconnection detection flag Y8 X8 CH4: Disconnection detection flag Y8 X8 CH4: Disconnection detection flag Y8 X9 CH4: Disconnection detection flag Y8 XA CH5: Disconnection detection flag Y8 XC Y0 Interlock signal for the A68RD3N is used in Y11 X11 Y11 Not used X11 Y13 X14 Y14 X15 Y16 X16	X2	Write data error flag	Y2		X2		Y2	CH1 Gain setting request
X4 detection flag Y4 X4 X4 detection flag Y4 X5 CH3: Disconnection detection flag Y5 X6 CH4: Disconnection detection flag Y6 X7 CH5: Disconnection detection flag Y7 X8 CH6: Disconnection detection flag Y8 X9 CH7: Disconnection detection flag Y8 X8 CH3: Disconnection detection flag Y8 X8 CH4: Disconnection detection flag Y9 XA CH4: Disconnection detection flag Y8 XA CH4: Disconnection detection flag Y8 XA CH4: Disconnection detection flag Y9 XA CH4: Disconnection detection flag Y8 XA CH4: Disconnection detection flag Y8 XA CH4: Disconnection detection flag Y8 XA CH4: Disconnection detection flag YA XA Obsconnection detection flag YA XB Y0 Interlock signal for the remote I/O station XD XF YF A68RD3N is used in remote I/O station XF X10 Y11 Not used XF X11 Y14 Y14 X14 Y14 X16 Y16 </td <td>Х3</td> <td></td> <td>Y3</td> <td></td> <td>Х3</td> <td>а а</td> <td>Y3</td> <td>-</td>	Х3		Y3		Х3	а а	Y3	-
X5 detection flag Y5 X6 CH4: Disconnection detection flag Y6 X7 CH5: Disconnection detection flag Y7 X8 CH6: Disconnection detection flag Y8 X9 CH7: Disconnection detection flag Y8 X9 CH7: Disconnection detection flag Y8 X8 X8 X8 X8 CH7: Disconnection detection flag Y8 XA CH8: Disconnection detection flag Y8 XA CH8: Disconnection detection flag YA XB YC Y8 XC Y2 Y8 Y0 Interlock signal for the X10 X10 Y1 X11 Y18 X12 Not used X13 Y18 X14 Y18 Y10 Not used Y11 Y12 Y12 Error code reset flag X13 Y18 X14 Y18 X16 Y16 X17 Y18 Y18 Y18 <td>X4</td> <td></td> <td>Y4</td> <td></td> <td>X4</td> <td></td> <td>Y4</td> <td>CH2 Gain setting request</td>	X4		Y4		X4		Y4	CH2 Gain setting request
X6 detection flag Y6 Not used X8 X7 CH5: Disconnection detection flag Y7 CH4 Offset setting request X8 CH6: Disconnection detection flag Y8 X9 CH7: Disconnection detection flag Y8 X4 CH8: Disconnection detection flag Y8 XA CH8: Disconnection detection flag Y8 XA CH8: Disconnection detection flag Y8 XA CH8: Disconnection detection flag YA XB YC X8 XA CH8: Disconnection detection flag YA X0 YC VC XB YC X2 XD YC Interlock signal for the A68RD3N is used in Y10 X12 Y10 Interlock signal for the X12 X12 Y10 Not used Y10 Not used Y10 Not used Y11 Y11 Y12 Error code reset flag Y13 Y16 X12 Y16 X12 Y16 X12 Y16 X13 Y16 X14 Y16 X15 Y16 X16 Y16 X17 Y16	X5		Y5		X5		Y5	-
X7 CH5: Disconnection detection flag Y7 CH4 Offset setting request X8 CH6: Disconnection detection flag Y8 X9 CH7: Disconnection detection flag Y8 XA CH6: Disconnection detection flag Y9 XA CH8: Disconnection detection flag Y8 XA CH8: Disconnection detection flag Y8 XA CH8: Disconnection detection flag YA XB YC X8 Offset/gain setting completion signal status flag YA XB YC YC X8 Not used YB XC YC YC Disconnection detection signal YB XC YC YC Conversion completion flag YD XE YF A68RD3N is used in remote I/O station XF X10 Y11 Not used Y12 X11 Y14 Y13 Y14 X15 Y16 Y17 X16 Y16 Y10 X17 Y17 Not used X18 Y18 X19 Y14 X19 Y14 X19 Y16 X10 Y16 X11 Y16 X18 Y16 <td< td=""><td>X6</td><td>detection flag</td><td>Y6</td><td>Not used</td><td>X6</td><td>Notused</td><td>Y6</td><td>CH3 Gain setting request</td></td<>	X6	detection flag	Y6	Not used	X6	Notused	Y6	CH3 Gain setting request
X8 detection flag Y8 X9 CH7: Disconnection detection flag Y9 XA CH8: Disconnection detection flag Y8 XB Y8 XA CH8: Disconnection detection flag YA XB Y8 XC Y8 Y0 Interlock signal for the remote I/O station XD YE YE RFRP and RTOP instructions when the A68RD3N is used in X11 X10 Y1 X11 Y12 X13 Y13 X14 Y13 X17 Y18 X18 Y18 X10 Y11 X11 Y12 X12 Not used Y13 Y13 Y14 Y14 X15 Y18 X16 Y11 X17 Y18 X17 Y18 X18 Y18 X10 Y11 X118 Y18 X12 Not used X13 Y18 X14 Y18 X15 Y18 X16 Y10 X17 X18 X18 X16 X17 X18 X18	X7	detection flag	Y7		X7		Y7	-
X9 detection flag Y9 XA CH8: Disconnection detection flag YA XB YB XC YB XD YB YC YA YD Interlock signal for the remote I/O station XF YF A68RD3N is used in remote I/O station Y11 X11 X11 X12 X13 X14 X15 X16 X17 X18 X11 X11 X12 X13 X14 X15 X16 X17 X18 X19 X10 X11 X12 Not used Y13 Y14 Y15 Y18 Y19 X11 X12 X13 X14 X15 X16 X17 X18 X19 X11 X12 X13 X14 X15 X16 X17 X18	X8	detection flag	Y8		X8		Y8	CH4 Gain setting request
XA detection flag YA XB YB XC YB XC YC XD YC XD YC XD YC XD YC YD Interlock signal for the RFRP and RTOP instructions when the A68RD3N is used in remote I/O station XE Conversion completion flag YE X10 Y1 Y11 Not used XF Error flag YF X10 Y11 Not used Y12 Error code reset flag X11 Y13 Y14 Y15 X16 Y16 Y16 X17 Y17 X18 Y18 X10 Y10 X11 Y14 X12 Not used Y13 Y14 Y14 Y15 X16 Y16 X17 Y16 X18 Y18 X10 Y16 X11 Y16 X18 Y18 X16 X16 X17 Y16 X18 A68RD3N is used in Y14 Y16 X15 A68RD3N is used in Y16 Y16 X17 Y16 <	X9	detection flag	Y9		X9	X9		
XC YC XC Disconnection detection signal YC XD YD Interlock signal for the PE XD XD Warning output signal YD XE YE RFRP and RTOP instructions when the A68RD3N is used in remote I/O station XE Conversion completion flag YE For clear request X10 Y11 Not used Y12 Error code reset flag YI3 YI4 Y14 X15 Y15 Y16 Y16 Y17 Not used X11 Y14 Y15 Y16 Y16 X17 Y18 Y18 Y18 Y18 X10 Y10 Not used Y11 Not used X11 Y14 Y15 Y16 X16 Y16 Y10 Not used X17 Y18 Y19 X1A Y16 Y10 X16 X17 Y16 X17 Y16 Y10 X18 Y18 X10 Interlock signal for the X1E X1E RFRP and RTOP instructions when the A68RD3N is used in Y1F	XA		YA			status flag		User range write request
XC YC XC signal YC XD YD Interlock signal for the RFRP and RTOP instructions when the A68RD3N is used in remote I/O station XD Warning output signal YD XF YE RFRP and RTOP instructions when the A68RD3N is used in remote I/O station XE Conversion completion flag YE Error clear request X10 Y11 Not used Y12 Error code reset flag YF Error clear request X13 Y13 Y14 Y15 Y15 Y16 Y16 X11 Y14 Y17 Y18 Y18 Y19 X18 Y18 Y19 Not used Y16 X10 Interlock signal for the X11 Y11 Not used Y16 X11 Y14 Y15 Y16 Y16 X19 Y14 Y17 Y18 Y18 X19 Y14 Y16 Y16 X110 Interlock signal for the X11E Y10 Y16 X112 RFRP and RTOP Y11E instructions when the A68RD3N is used in Y1F	XB		YB		XB		YB	
XE YE RFRP and RTOP instructions when the A68RD3N is used in remote I/O station XE Conversion completion flag YE X10 YF A68RD3N is used in remote I/O station XF Error flag YF Error clear request X10 Y11 Not used Y12 Error code reset flag Y13 X14 Y14 Y14 Y16 X16 Y16 Y16 X17 Y17 X18 Y18 X19 Y14 X10 Y16 X11 Y18 X19 Y10 X1A Y18 X19 Y16 X10 Interlock signal for the X1E X1E RFRP and RTOP Y1E instructions when the A68RD3N is used in X1F A68RD3N is used in						signal		Not used
XE YE instructions when the A68RD3N is used in remote I/O station XE flag YE X10 YF A68RD3N is used in remote I/O station XF Error flag YF Error clear request X10 Y10 Not used Y12 Error code reset flag YF YF Error clear request X13 Y13 Y13 Y14 Y15 Y16 X11 Y16 Y17 Y18 Y18 X18 Y18 Y19 Not used X11 Y14 Y19 X11 Y11 Not used X11 Y16 X11 Y18 X19 Y10 X11 Y11 X11 Y11 X12 Flag Y13 Y13 X14 Y15 X16 Y16 X17 Y11 X18 Y18 X110 Interlock signal for the X1F X1F A68RD3N is used in X1F A68RD3N is used in	XD		YD	-	XD		YD	
XFYFremote I/O stationXFError flagYFError clear requestX10X11Not usedY11Not usedY11Not usedX11X12Y12Error code reset flagY13X13Y14Y14X15Y16Y16X17Y17Y18X18Y19Y14X16Y10X11Y11X11Y11X12Y11X13Y11X14Y12X17Y18X19Y19X1AY11X11Interlock signal for the Y10X11Interlock signal for the Y10X12RFRP and RTOPX14Y15X15KFRP and RTOPX16Y16X17Y17X18Y18X10Interlock signal for the A68RD3N is used inX1FA68RD3N is used inX1FA68RD3N is used inX1FA68RD3N is used inX1FA68RD3N is used in	XE		YE	instructions when the	XE		YE	
X11Not usedX12Not usedX13Y12X13Y13X14Y13X15Y15X16Y16X17Y17X18Y18X19Y19X1AY1AX1BY11X1CY11X1DInterlock signal for the Y1DX1ERFRP and RTOPX1FA68RD3N is used inX1FA68RD3N is used in					XF	Error flag	YF	Error clear request
X12Not usedY12Error code reset flagX13Y13X14Y13X14Y14X15Y15X16Y16X17Y17X18Y18X19Y19X1AY18X1BY11X1CY11X1DInterlock signal for theX1DInterlock signal for theX1ERFRP and RTOPX1ERFRP and RTOPX1FA68RD3N is used inX1FA68RD3N is used in				Not used				
X13 Y13 X14 Y14 X15 Y15 X16 Y16 X17 Y17 X18 Y18 X19 Y19 X1A Y1A X1B Y1B X1C Y1C X1D Interlock signal for the Y1C X1D Interlock signal for the Y1C X1E RFRP and RTOP X1E RFRP and RTOP X1F A68RD3N is used in		Not used		Error code reset flag				
X15Y15X16Y16X17Y17X18Y18X19Y19X1AY1AX1BY1BX1CY1CX1DInterlock signal for theX1DInterlock signal for theX1ERFRP and RTOPX1ERFRP and RTOPX1EA68RD3N is used inX1FA68RD3N is used in								
X16Y16X17Y17X18Y18X19Y19X1AY1AX1BY1BX1CY1CX1DInterlock signal for theX1ERFRP and RTOPX1ERFRP and RTOPX1FA68RD3N is used inX1FA68RD3N is used in	X14		Y14					
X17Y17X18Y18X19Y19X1AY1AX1BY1BX1CY1CX1DInterlock signal for theX1ERFRP and RTOPX1ERFRP and RTOPX1FA68RD3N is used inY1F	X15		Y15					
X18Y18X19Y19X1AY1AX1BY1BX1CY1CX1DInterlock signal for theX1ERFRP and RTOPX1ERFRP and RTOPX1EA68RD3N is used inY1F	X16		Y16					
X19Y19X1AY1AX1BY1BX1CY1CX1DInterlock signal for theX1DInterlock signal for theX1ERFRP and RTOPX1ERFRP and RTOPX1EA68RD3N is used inY1F	X17		Y17					
X1AY1ANot usedX1BY1BY1BX1CY1CX1DInterlock signal for theY1DX1ERFRP and RTOPY1Einstructions when theY1FX1FA68RD3N is used inY1F								
X1BY1BX1CY1CX1DInterlock signal for the X1EY1DX1ERFRP and RTOPY1Einstructions when the A68RD3N is used inY1F								
X1CY1CX1DInterlock signal for the X1EY1DX1ERFRP and RTOPY1Einstructions when the A68RD3N is used inY1F				Not used				
X1DInterlock signal for the X1EY1DX1ERFRP and RTOPY1Einstructions when the A68RD3N is used inY1F								
X1ERFRP and RTOPY1Einstructions when the A68RD3N is used inY1F		Interlock signal for the	-					
X1F A68RD3N is used in Y1F		-						
X1F A68RD3N is used in Y1F								
	X1F		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	R/W	4	CH4 Time/count averaging setting	
5	CH4 Averaging time/count	10.00	5		
6	CH5 Averaging time/count		6	System area (Not used)	_
7	CH6 Averaging time/count		7		
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	System area (Not used)	
17	CH8 Detected temperature value (16bit)		17		-
18	CH1 Detected temperature value (L)		18		
19	(32bit) (H)		19	Error code	R
20	CH2 Detected temperature value (L)		20	Setting range	IX IX
21	(32bit) (H)	R	21		
22	CH3 Detected temperature value (L)	n.	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	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	CH1 Scaling value	-				
51	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	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	CH4 Scaling range lower limit value (L)					
75	(H)	-				
76	CH4 Scaling range upper limit value (L)					
77	(H)	R/W				
78	CH1 Scaling width lower limit value	-				
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 85	CH4 Scaling width lower limit value CH4 Scaling width upper limit value	-				
86	CH1 Warning output lower (L)	-				
87	lower limit value (H)					
88	CH1 Warning output lower (L)	-				
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)	D.44/				
119	(H)	R/W				
120	CH1 Gain temperature setting value (L)					
121	(H)					
	to					

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

Memo

4.5 A68RD3N (Replacement to the Q64RD-G)

4.5.1 Performance comparison

Ite	em	A68RD3N		
Measuring met		3-wire type		
measurig	ilou	16-bit signed binary		
		-1800 to 6000		
Output (temper	rature	Value up to the first decimal place × 10		
conversion valu		32-bit signed binary		
		-180000 to 600000		
		Value up to the third decimal place × 1000		
		Pt100		
Applicable RTE		(JIS C1604-1997, IEC 751-am2, JIS C1604-1989, DIN 43760-1980)		
		JPt100		
		(JIS C1604-1981)		
	Pt100	-180 to 600°C		
Measured	Ptilu	(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 spe	eed	40ms/channel		
Number of ana	log input points	8 channels/module		
	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	_	
Dielectric withs	tand 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 connection system		38-point terminal block		
Applicable wire size		0.75 to 2mm ²		
Applicable solderless terminal		V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A		

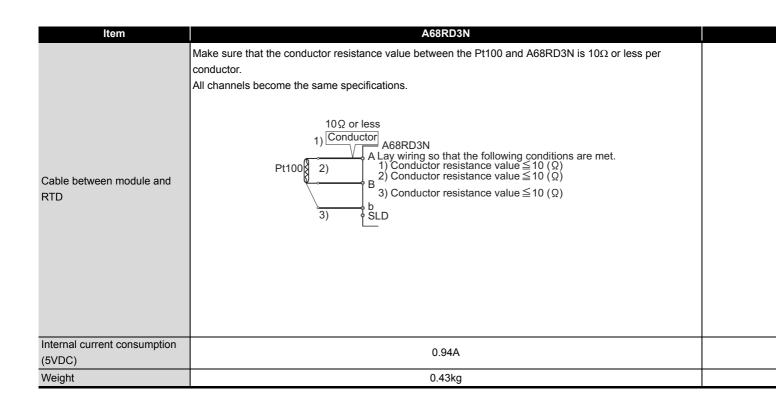
Q64RD-G

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 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 -60 to 180°C	0	
*1	0	
0.025°C	0	
40ms/channel	0	
4 channels/module	Δ	Consider replacement with multiple Q64RD-G.
1mA	0	
Isolated areaIsolation methodDielectric withstand voltageInsulation resistanceBetween RTD input and programmable controller power supplyPhotocoupler isolation1780VrmsAC/3 cycles (altitude 2000m)10MΩ or more using 500VDC insulation resistance testerBetween RTD input and channelTransformer isolation-10MΩ or more using 500VDC insulation resistance tester	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.)	×	

 $O: Compatible, \triangle: Partial change required, <math>\times: Incompatible$ Compatibility Precautions for replacement

*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)		
Tomporatura coofficient	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)		



	O: Compatible, 4	: Partial change required, ×: 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 10Ω or less.)		
Conductor 2) Pt100 Conductor 2) Pt100 Conductor 1) Conductor Conductor Conductor 064RD-G a1 b1 SLD Conductor a1 b1 SLD Conductor a1 b1 SLD Conductor a1 b1 SLD Conductor a1 b1 SLD Conductor a1 b1 SLD Conductor a1 b1 SLD Conductor a1 b1 SLD Conductor a1 b1 SLD Conductor a1 b1 SLD	0	
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 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	
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.

	A68RD3N				Q64RD-G				
Device	Signal name	Device	Signal name	Device	Signal name	Device	Signal name		
No. X0		No. Y0		No. X0	Module READY	No. Y0	Not used		
λ0	Watchdog timer error flag	fU			CH1 Offset/gain setting		CH1 Offset setting		
X1	READY flag	Y1		X1	status signal	Y1	request		
X2	Write data error flag	Y2		X2	CH2 Offset/gain setting status signal	Y2	CH1 Gain setting request		
X3	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	Not used	Y6	CH3 Gain setting request		
X7	CH5: Disconnection detection flag	Y7		X7		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 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 RFRP and RTOP	XD	Warning output signal	YD			
XE		YE	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 X11	-	Y10 Y11	Not used						
X11	Not used	Y12	Error code reset flag						
X13		Y13		-					
X14		Y14							
X15		Y15							
X16		Y16							
X17		Y17							
X18		Y18							
X19 X1A		Y19 Y1A	Not used						
X1A X1B	•	Y1B							
X1D X1C	-	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			J					

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.

	A68RD3N			Q64RD-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 averaging setting	
2	CH1 Averaging time/count		2	CH2 Time/count/moving averaging setting	R/W
3	CH2 Averaging time/count		3	CH3 Time/count/moving averaging setting	
4	CH3 Averaging time/count	R/W	4	CH4 Time/count/moving averaging setting	
5	CH4 Averaging time/count	10.00	5		
6	CH5 Averaging time/count		to	System area (Not used)	_
7	CH6 Averaging time/count				
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)				
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)	n	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		
			37		
			38		
			39		
			40		
			41		
			42		
			43		
			44		
			45		
			46		
			47	Warning output enable/disable setting	R/W

Address (decimal)NameRead/write48Warning output flag49Disconnection detection flag50 to 53CH1 to CH4 Scaling value54CH1 Measured temperature value (L)54(32bit)(H)60CH4 Measured temperature value (L)R61(32bit)(H)62CH1 Scaling range lower limit value (L)R63(H)R/W64CH1 Scaling range upper limit (L)R/W65value(H)76CH4 Scaling range upper limit value77value(H)78CH1 Scaling width lower limit value79CH1 Scaling width upper limit value79CH1 Scaling width upper limit value79CH1 Scaling output lower (L)87lower limit value88CH1 Warning output lower (L)89upper limit value90CH1 Warning output upper (L)91lower limit value93upper limit value94CH1 Offset temperature setting (L)95value116CH4 Warning output upper (L)117upper limit value118CH1 Offset temperature setting (L)120CH1 Gain temperature setting (L)133value134Extended averaging processing selection135to134System area (Not used)149System area (Not used)		Q64RD-G					
48Warning output flag49Disconnection detection flag50 to 53CH1 to CH4 Scaling value54CH1 Measured temperature value (L)55(32bit)(H)60CH4 Measured temperature value (L)61(32bit)(H)62CH1 Scaling range lower limit value (L)63(H)64CH1 Scaling range upper limit (L)65value(H)76CH4 Scaling range upper limit (L)77value(H)78CH1 Scaling width lower limit value79CH1 Scaling width upper limit value79CH1 Scaling width upper limit value79CH1 Scaling output lower (L)85CH4 Scaling output lower (L)86CH1 Warning output lower (L)87lower limit value90CH1 Warning output upper (L)91lower limit value92CH1 Warning output upper (L)93upper limit value94CH1 Offset temperature setting (L)116CH4 Warning output upper (L)117upper limit value118CH1 Offset temperature setting (L)119value120CH1 Gain temperature setting (L)132CH4 Gain temperature setting (L)133value134Extended averaging processing selection135 toSystem area (Not used)		Name	Read/write				
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54 CH1 Measured temperature value (L) (32bit) (H) 55 (32bit) (H) 60 CH4 Measured temperature value (L) (32bit) (H) 61 (32bit) (H) 62 CH1 Scaling range lower limit value (L) (H) R 63 (H) R/W 64 CH1 Scaling range upper limit (L) value (H) 65 value (H) 76 CH4 Scaling range upper limit (L) value R/W 77 value (H) 78 CH1 Scaling width lower limit value R/W 79 CH1 Scaling width upper limit value R/W 85 CH4 Scaling output lower (L) R/W 86 CH1 Warning output lower (L) R/W 87 lower limit value (H) R/W 90 CH1 Warning output upper (L) R/W 91 lower limit value (H) 92 CH1 Warning output upper (L) R/W 93 upper limit value (H) 116 CH4 Warning output upper (L)	49	Disconnection detection flag					
55 (32bit) (H) to to 60 CH4 Measured temperature value (L) R 61 (32bit) (H) R 62 CH1 Scaling range lower limit value (L) R 63 (H) R/W 64 CH1 Scaling range upper limit (L) R/W 65 value (H) R/W 65 value (H) R/W 76 CH4 Scaling range upper limit (L) R/W 77 value (H) R/W 78 CH1 Scaling width lower limit value R/W 79 CH1 Scaling width upper limit value R/W 85 CH4 Scaling width upper limit value R/W 86 CH1 Warning output lower (L) R/W 87 lower limit value (H) R/W 90 CH1 Warning output upper (L) R/W R/W 91 lower limit value (H) R/W 92 CH1 Warning output upper (L) R/W 93 upper	50 to 53	CH1 to CH4 Scaling value	R				
to to 60 CH4 Measured temperature value (L) (32bit) R 61 (32bit) (H) R 62 CH1 Scaling range lower limit value (L) R/W 63 (H) R/W 64 CH1 Scaling range upper limit (L) R/W 65 value (H) R/W 65 value (H) R/W 76 CH4 Scaling range upper limit (L) R/W 77 value (H) R/W 78 CH1 Scaling width lower limit value R/W 77 value (H) R/W 85 CH4 Scaling width upper limit value R/W 86 CH1 Warning output lower (L) R/W 87 lower limit value (H) R/W 90 CH1 Warning output lower (L) R/W 91 lower limit value (H) R/W 92 CH1 Warning output upper (L) R/W 93 upper limit value (H) R/W	54	CH1 Measured temperature value (L)					
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To to 85 CH4 Scaling width upper limit value 86 CH1 Warning output lower (L) R/W 86 CH1 Warning output lower (L) R/W 87 lower limit value (H) 88 CH1 Warning output lower (L) R/W 90 CH1 Warning output upper (L) R/W 91 lower limit value (H) 92 CH1 Warning output upper (L) R/W 93 upper limit value (H) 94 CH4 Warning output upper (L) R/W 116 CH4 Warning output upper (L) R/W 117 upper limit value (H) 118 CH1 Offset temperature setting (L) R/W 119 value (H) 120 CH1 Gain temperature setting (L) R/W 132 CH4 Gain temperature setting (L) R/W 133 value (H) R/W 134 Extended averaging processing selection - 135 to System area (Not used) - 148 Conversion setting for disconn	78	CH1 Scaling width lower limit value	R/W				
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86CH1 Warning output lower (L) lower limit valueR/W87lower limit value(H)88CH1 Warning output lower (L) upper limit value(H)90CH1 Warning output upper (L) lower limit value(H)91lower limit value(H)92CH1 Warning output upper (L) upper limit value(H)93upper limit value(H)116CH4 Warning output upper (L) upper limit value(H)117upper limit value(H)118CH1 Offset temperature setting (L) value(H)120CH1 Gain temperature setting (L) value(H)132CH4 Gain temperature setting (L) valueR/W134Extended averaging processing selection-135 to 147System area (Not used)-148Conversion setting for disconnection detectionR/W							
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93 upper limit value (H) to 116 CH4 Warning output upper (L) 117 upper limit value (H) 118 CH1 Offset temperature setting (L) R/W 119 value (H) 120 CH1 Gain temperature setting (L) R/W 121 value (H) to 132 CH4 Gain temperature setting (L) 133 value (H) 134 Extended averaging processing selection R/W 135 to System area (Not used) - 147 Conversion setting for disconnection detection R/W	92						
to 116 CH4 Warning output upper (L) 117 upper limit value (H) 118 CH1 Offset temperature setting (L) 119 value (H) 120 CH1 Gain temperature setting (L) 121 value (H) Table CH4 Gain temperature setting (L) 132 CH4 Gain temperature setting (L) 133 value (H) 134 Extended averaging processing selection 135 to 135 to 147 System area (Not used) 148 Conversion setting for disconnection detection R/W	93						
117upper limit value(H)118CH1 Offset temperature setting (L)R/W119value(H)120CH1 Gain temperature setting (L)R/W121value(H)122CH4 Gain temperature setting (L)R/W132CH4 Gain temperature setting (L)R/W133value(H)134Extended averaging processing selection135 toSystem area (Not used)-148Conversion setting for disconnection detectionR/W							
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118CH1 Offset temperature setting (L)R/W119value(H)120CH1 Gain temperature setting (L)121value(H)to132CH4 Gain temperature setting (L)133value(H)134Extended averaging processing selection135 toSystem area (Not used)-148Conversion setting for disconnection detectionR/W	117	upper limit value (H)					
119 value (H) 120 CH1 Gain temperature setting (L) 121 value (H) to 132 CH4 Gain temperature setting (L) 133 value (H) 134 Extended averaging processing selection 135 to System area (Not used) - 148 Conversion setting for disconnection detection R/W	118						
120 CH1 Gain temperature setting (L) 121 value (H) to 132 CH4 Gain temperature setting (L) 133 value (H) 134 Extended averaging processing selection 135 to System area (Not used) - 148 Conversion setting for disconnection detection R/W	119	value (H)	R/W				
121 value (H) to to 132 CH4 Gain temperature setting (L) 133 value 134 Extended averaging processing selection 135 to System area (Not used) 147 Conversion setting for disconnection detection	120	, ,					
to 132 CH4 Gain temperature setting (L) 133 value (H) R/W 134 Extended averaging processing selection - 135 to System area (Not used) - 147 Conversion setting for disconnection detection R/W	121						
133 value (H) R/W 134 Extended averaging processing selection - 135 to 147 System area (Not used) - 148 Conversion setting for disconnection detection R/W							
133 value (H) R/W 134 Extended averaging processing selection - 135 to 147 System area (Not used) - 148 Conversion setting for disconnection detection R/W	132						
134 Extended averaging processing selection 135 to System area (Not used) 147 Conversion setting for disconnection detection			R/W				
135 to 147 System area (Not used) - 148 Conversion setting for disconnection detection R/W			1				
147 System area (Not used) - 148 Conversion setting for disconnection detection R/W							
148 detection R/W		System area (Not used)	-				
149 System area (Not used) -	148	e e e e e e e e e e e e e e e e e e e	R/W				
	149	System area (Not used)	-				

Q64RD-G							
Address (decimal)	Name	Read/write					
150	CH1 Conversion setting value for (L)	R/W					
151	disconnection detection (H)	R/W					
	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 444					
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)	FV/ VV					

Memo

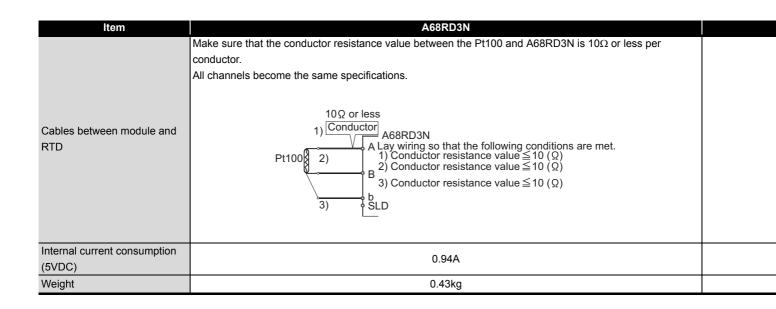
4.6 A68RD3N (Replacement to the Q68RD3-G)

4.6.1 Performance comparison

lte	em	A68RD3N				
Measuring met		3-wire type				
measuring met	liou	16-bit signed binary				
		-1800 to 6000				
Output (temper	ature	Value up to the first decimal place × 10				
conversion valu		32-bit signed binary				
conversion valu		-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 RTD)	JPt100				
		(JIS C1604-1981)				
	Dittoo	-180 to 600°C				
Measured	Pt100	(27.10 to 313.71Ω)				
temperature	JPt100	-180 to 600°C				
range	JPIIOU	(25.80 to 317.28Ω)				
	Ni100					
Accuracy		±1%				
, loodi doy		(accuracy at full scale)				
Resolution		0.025°C				
		40ms/channel				
Conversion spe	eed					
Number of ana		8 channels/module				
Output current	for temperature	1mA				
detection		Determination DTD in a tradition of the sector line of the sector line of the sector line is the feature of the	-			
Isolation metho	od	Between platinum RTD input and programmable controller power supply: photocoupler isolation				
		Between platinum RTD input and channel: non-isolation	-			
Dielectric withs	tand voltage	Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute				
		provide the second sec				
Disconnection detection		Detected per channel				
Number of easy	uniad I/O painta	32 points				
	upied I/O points	(I/O assignment: special 32 points)				
External conne	-	38-point terminal block				
External device		-				
(sold separately						
Applicable wire		0.75 to 2mm ²				
Applicable sold	lerless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A				

O : Compatible, \bigtriangleup : Partial change required, ×: Inc	ompatible
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Q68RD3-G	Compatibility Precautions for replacem		
3-wire type	0		
16-bit signed binary -2000 to 8500 Value up to the first decimal place × 10	Δ	32-bit output is not available.	
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 Q68RD3-G.	
-200 to 850°C -180 to 600°C -60 to 180°C	0		
*1	0		
0.1°C	Δ	The resolution reduces.	
320ms/8 channels		The conversion speed is fixed at 320ms, regardless of the number of enable channels.	
8 channels/module	0		
1mA	0		
Isolated areaIsolation methodDielectric withstand voltageInsulation resistanceBetween RTD input and programmable controller power supplyTransformer isolation500VACrms /minute10MΩ or more using 500VDC insulation resistanceBetween RTD input and channelTransformer isolation1000VACrms /minute1000VACrms tester	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.	
40-pin connector A6CON4	×	Wiring change is required. Prepare the A6CON4 separately.	
 0.3 mm ²	×		
-	×		

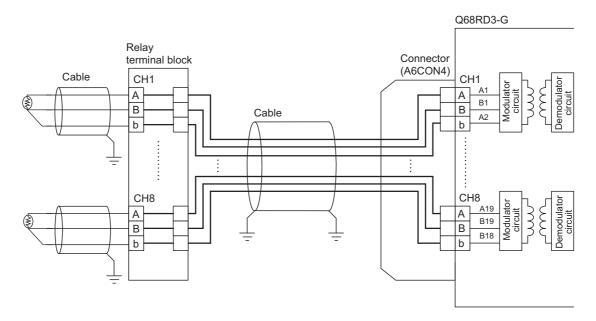


		Δ : Partial change required, ×: Incompatible
Q68RD3-G	Compatibility	Precautions for replacement
*2	Δ	Install a relay terminal block outside.
0.54A	0	
0.20kg	0	

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

Conversion accuracy		Specifications
Pt100	-200 to 850°C ^{*1}	±0.8°C (Ambient temperature: 25±5°C), ±2.4°C (Ambient temperature: 0 to 55°C)
	-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

Mana.	Description	A 00 D D 0 1		O : Available, - : Not available
Item Conversion enable/disable	Description Enables/disables a detection of	A68RD3N	Q68RD3-G	Precautions for replacement
specification of each channel	temperature.	U	U	
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	Signal name	Device	Signal name	Device	Signal name	Device	Signal name
No. X0	Watchdog timer error flag	No. Y0		No. X0	Module READY	No. Y0	
X0 X1	READY flag	Y1		X0 X1		Y1	
X1 X2	Write data error flag	Y2		X1 X2		Y2	-
	CH1: Disconnection					-	
X3	detection flag	Y3		X3		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	
X9	CH7: Disconnection detection flag	Y9		X9	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
XB		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 X12	Not used	Y11 Y12	Error code reset flag				
X12 X13		Y13	LITOI COde reset hay				
X10		Y14					
X15		Y15					
X16		Y16					
X17		Y17					
X18		Y18					
X19		Y19					
X1A		Y1A	Not used				
X1B		Y1B					
X1C		Y1C					
X1D	Interlock signal for the	Y1D					
X1E	RFRP and RTOP	Y1E					
	instructions when the	N/4 =					
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		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			27	Offset/gain setting mode (Gain specification)	
28	CH6 Detected temperature value (L)		28	CH1 Offset temperature setting value	
29	(32bit) (H)		29	CH1 Gain temperature setting value	ļ
30	CH7 Detected temperature value (L)		30	CH2 Offset temperature setting value	ļ
31	(32bit) (H)	R	31	CH2 Gain temperature setting value	R/W
32	CH8 Detected temperature value (L)		32	CH3 Offset temperature setting value	
33	(32bit) (H)		33	CH3 Gain temperature setting value	
34	Write data error code	R/W	34	CH4 Offset temperature setting value	ļ
35	Conversion completion flag	R	35	CH4 Gain temperature setting value	ļ
36	Specification of platinum RTD type	R/W	36	CH5 Offset temperature setting value	
			37	CH5 Gain temperature setting value	
			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				
42	CH8 Offset temperature setting value	R/W			
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)	_			
49	Disconnection detection flag	R			
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				
63	CH1 Scaling range upper limit value	R/W			
	to	<u> </u>			
77	CH8 Scaling range upper limit value				
78	CH1 Scaling width lower limit value	R/W			
79	CH1 Scaling width upper limit value				
	to	I			
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				
01	to	<u> </u>			
125	CH8 Process alarm upper/upper limit value				
100 1- 100	CH1 to CH8 Rate alarm warning detection				
126 to 133					
134	CH1 Rate alarm upper limit value				
135	CH1 Rate alarm lower limit value				
	to	I			
149	CH8 Rate alarm lower limit value	R/W			
150 to 157	System area (Not used)	-			
158 to 159	Mode switching setting	R/W			
160 to 163		-			
	Conversion setting for disconnection				
164	detection (CH1-CH4)				
405	Conversion setting for disconnection	5444			
165	detection (CH5-CH8)	R/W			
4004 470	CH1 to CH8 Conversion setting value for				
166 to173	disconnection detection				
174 to 189	System area	-			
190	CH1 Factory default offset value				
191	CH1 Factory default gain value	1			
192	CH1 User range settings offset value				
193	CH1 User range settings gain value				
194	CH1 User range settings offset (L)	R/W			
195	resistance value (H)				
196	CH1 User range settings gain (L)	1			
197	resistance value (H)				
101	to	I			
	CH8 User range settings gain resistance				
253	value (H)	R/W			

4.7 A68RD4N (Replacement to the Q64RD)

4.7.1 Performance comparison

lte	em	A68RD4N			
Measuring meth		4-wire type			
nicada	100	16-bit signed binary			
		-1800 to 6000			
Output (tempera	ature	Value up to the first decimal place × 10			
conversion valu		32-bit signed binary			
•••••	.,	-180000 to 600000			
		Value up to the third decimal place × 1000			
		Pt100	1		
		(JIS C1604-1997, IEC 751-am2, JIS C1604-1989, DIN 43760-1980)			
Applicable platin	num RTD	JPt100			
		(JIS C1604-1981)			
Maggurod	D4100	-180 to 600°C			
	Pt100	(27.10 to 313.71Ω)			
temperature	JPt100	-180 to 600°C			
range	JPLIOU	(25.80 to 317.28Ω)			
Accuracy		±1%			
Roodracy		(accuracy at full scale)			
Resolution		0.025°C			
Conversion spe	ed	40ms/channel			
Number of anal	og input points	8 channels/module			
Output current f detection	for temperature	1mA			
		Between platinum RTD input and programmable controller power supply: photocoupler isolation			
Isolation method	d	Between platinum RTD input and programmable controller power supply, photocouplet isolation			
Dielectric withstand voltage		Between platinum RTD input and programmable controller power supply: 500VAC, for 1 minute			
Disconnection of	detection	Batch-detected at all channels			
Number of occu	inied I/O points	32 points			
Number of occo		(I/O assignment: special 32 points)			
External connect	ction system	38-point terminal block			
Applicable wire	size	0.75 to 2mm ²			
Applicable solde	erless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A			

	O. Compatible,	\triangle : 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 Value up to the third decimal place × 1000	0	
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 areaIsolation methodDielectric withstand voltageInsulation resistanceBetween platinum RTD input and programmable controller power supplyPhotocoupler isolation1780VrmsAC/3 cycles (altitude 2000m)10MΩ or more using 500VDC insulation resistance testerBetween platinum RTD input and channelNon-isolation-tester	0	
Detected per channel	0	The number of ecouried 1/0 points
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.
1.25-3, R1.25-3 (Sleeved solderless terminal cannot be used.)	×	

O: Compatible, △: Partial change required, ×: Incompatible Compatibility Precautions for replacement

ltem	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 H.1 CH.1 CH.1 CH.2	
Internal current consumption (5VDC)	0.41A	
Weight	0.43kg	

	O: Compatible,	Δ : Partial change required, ×: 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 10Ω or less.)		
Pt100 Conductor 1) Conductor	0	
 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.

A68RD4N					Q64	4RD	
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
X3	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 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		ХС	Disconnection detection 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	A68RD4N is used in remote I/O station	XF	Error flag	YF	Error clear request
X10 X11		Y10 Y11	Not used				
X12		Y12	Error code reset flag				
X13		Y13					
X14		Y14					
X15 X16		Y15 Y16					
X10		Y17					
X18		Y18					
X19		Y19					
X1A			Not used				
X1B		Y1B					
X1C X1D	Interlock signal for the	Y1C Y1D					
X1D X1E	RFRP and RTOP	Y1D Y1E					
	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	R/W	4	CH4 Time/count averaging setting	
5	CH4 Averaging time/count		5		
6	CH5 Averaging time/count		6	System area (Not used)	_
7	CH6 Averaging time/count		7		
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	System area (Not used)	_
17	CH8 Detected temperature value (16bit)		17		
18	CH1 Detected temperature value (L)		18		
19	(32bit) (H)		19	Error code	R
20	CH2 Detected temperature value (L)		20	Setting range	
21	(32bit) (H)	R	21		
22	CH3 Detected temperature value (L)		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	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

MELSEC

	Q64RD	
Address (decimal)	Name	Read/write
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)	
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		
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	CH4 Scaling range lower limit value (L)	
75	(H)	
76	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		
88	()	-
	CH1 Warning output lower/upper (L) limit value (H)	
89	()	_
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)	
119	value (H)	R/W
120	CH1 Gain temperature setting (L)	-
121	value (H)	
	to	I
132	CH4 Gain temperature setting (L)	R/W
152		

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

Memo

4.8 A68RD4N (Replacement to the Q64RD-G)

4.8.1 Performance comparison

lt	em	A68RD4N	
Measuring me	thod	4-wire type	
		16-bit signed binary	
		-1800 to 6000	
Output (tempe	rature	Value up to the first decimal place × 10	
conversion val	ue)	32-bit signed binary	
		-180000 to 600000	
		Value up to the third decimal place × 1000	
		-	
Applicable RTI	D	(JIS C1604-1997, IEC 751-am2, JIS C1604-1989, DIN 43760-1980)	
		JPt100	
		(JIS C1604-1981)	
		-180 to 600°C	
Measured	Pt100	(27.10 to 313.71Ω)	
temperature	10400	-180 to 600°C	
range	JPt100	(25.80 to 317.28Ω)	
	Ni100		
Accuracy		±1%	
		(accuracy at full scale)	
Resolution		0.025°C	
Conversion sp	eed	40ms/channel	
Number of ana	alog input points	8 channels/module	
Output current detection	for temperature	1mA	
		Between platinum RTD input and programmable controller power supply: photocoupler isolation	
Isolation metho	od	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 coo	supied I/O points	32 points	
Number of occupied I/O points		(I/O assignment: special 32 points)	
External conne	ection system	38-point terminal block	
Applicable wire	e size	0.75 to 2mm ²	
Applicable solo	derless terminal	V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A	

Q64RD-G

Q84ND-6	Compatibility	Frecautions 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 -60 to 180°C	0	
*1	0	
0.025°C	0	
40ms/channel	0	
4 channels/module	Δ	Consider replacement with multiple Q64RD-G.
1mA	0	
Isolated areaIsolation methodDielectric withstand voltageInsulation resistanceBetween RTD input and programmable controller power supplyPhotocoupler isolation1780VrmsAC/3 cycles (altitude 2000m)10MΩ or more using 500VDC insulation resistance testanceBetween RTD input and channelTransformer isolation-tester	0	
Detected per channel 16 points	0	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.
1.25-3 R1.25-3 (Sleeved solderless terminal cannot be used.)	×	

O : Compatible, △ : Partial change required, ×: Incompatible Compatibility Precautions for replacement

*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)		
Tomporaturo coofficient	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)		

Itom		
Item 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 CH.2 Dt1/2 CH.2 Dt1/2 CH.	
Internal current consumption (5VDC)	0.41A	
Weight	0.43kg	

	O: Compatible,	riangle : Partial change required, ×: 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.)		
Conductor 2) P1100 1) Conductor A1 A1 B1 b1 SLD Conductor Q64RD-G a1 A1 B1 b1 SLD Q64RD-G a1 A1 B1 b1 SLD Conductor 1) SLD 1) SLD	Ο	
0.62A	Δ	The recalculation of internal current consumption (5VDC) is required.
 0.20kg	0	

4.8.2 Functional comparison

				O : Available, - : Not availab
Item	Description	A68RD4N	Q64RD-G	Precautions for replacement
Conversion enable/disable	Enables/disables a detection of	0	0	
specification of each channel	temperature.	-	-	
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				Q64I	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
X3	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 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	
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 X11		Y10 Y11	Not used				
X12		Y12	Error code reset flag				
X13		Y13					
X14		Y14					
X15 X16		Y15 Y16					
X10 X17		Y17					
X18		Y18					
X19		Y19					
X1A		Y1A	Not used				
X1B		Y1B					
X1C		Y1C					
X1D	Interlock signal for the	Y1D					
X1E	RFRP and RTOP	Y1E					
X1F	instructions when the A68RD4N is used in	Y1F					
	remote I/O station	TIF					

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 (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	R/W
3	CH2 Averaging time/count	R/W	3	CH3 Time/count/moving average/time constant setting	
4	CH3 Averaging time/count		4	CH4 Time/count/moving average/time constant setting	
5	CH4 Averaging time/count		5		
6	CH5 Averaging time/count		to	System area	
7	CH6 Averaging time/count		10	Systematea	-
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)				
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
21	(32bit) (H)	_	21	Setting range 2	
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)	1	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		

	Q64RD-G	
Address	Name	Read/write
(decimal)	Name	Reau/write
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)	R/W
64	CH1 Scaling range upper limit value (L)	10,00
65	(H)	
	to	
76	CH4 Scaling range upper limit (L)	
77	value (H)	R/W
78	CH1 Scaling width lower limit value	10.00
79	CH1 Scaling width upper limit value	
	to	<u>.</u>
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)	R/W
90	CH1 Warning output upper lower (L)	
91	limit value (H)	
92	CH1 Warning output upper upper (L)	
93	limit value (H)	
	to	. <u> </u>
116	CH4 Warning output upper upper (L)	
117	limit value (H)	4
118	CH1 Offset temperature setting value (L)	R/W
119	(H)	4
120	CH1 Gain temperature setting value (L)	
121	(H)	L
100	to	· · · · · ·
132	CH4 Gain temperature setting value (L)	
133	(H)	R/W
134	Extended averaging processing selection	<u> </u>
135 to 147	System area (Not used)	-
148	Conversion setting for disconnection	R/W
140	detection	<u> </u>
149	System area (Not used)	-
150	CH1 Conversion setting value for (L)	R/W
151	disconnection detection (H)	<u> </u>

Q64RD-G				
Address (decimal)	Name	Read/write		
	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 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)	1.7.44		

Memo

5 MULTIPLEXER REPLACEMENT

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	-10 to 0 to +10VDC (Input resistance value: $1M\Omega$)				
Analog input	Current	Current -20 to 0 to +20mAD		e: 250Ω)			
Analog output	voltage		-10 to 0 to +10VDC				
		Analog ir	nput range	Analog output voltage (V)			
		Voltage (V)	Current (mA)	Analog output voltage (V)			
		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 0 to +10						
			+ 4 to +20	0 to +10			
			-20 to +20				
I/O characteris	tico	- 5 to + 5	-20 to +20				
1/O characteris	aucs	0 to +10	0 to +20	0 to + 5			
	0 to + 5 0 to +20 0 to +		0 10 + 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		-1010+10			
		-10 to +10	-20 to +20	- 5 to + 5			
		- 5 to + 5	-20 to +20	- 3 10 + 3			

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

								tal change required, *. Incompatible
		Q68AD	V		Q68ADI		Compatibility	Precautions for replacement
	-10 to 10VDC							
	(Input resistance value: $1M\Omega$)				-			The voltage/current cannot be mixed for one module.
					0 to 20mADC			
		-		(In	put resistance va	lue: 250Ω)		
				-			-	
			Normal resolution mode		High resolution mode			
		g input	Digital	Maximum	Digital	Maximum		When using A616AD in [-5 to +
	Idi	nge	output value	resolution	output value	resolution		5V] range, Q68ADV can obtain
		0 to 10V		2.5mV	0 to 16000	0.625mV		equivalent resolution or more
		0 to 5V	0 to 4000	1.25mV	0 to 12000	0.416mV		than A616AD by setting in [-10
	Voltage	1 to 5V		1.0mV	01012000	0.333mV		to 10V] range/high resolution mode or user range. When using A616AD in [-20 to +20mA range, use Q68ADI in user range.
	voltage	-10 to 10V		2.5mV	-16000 to 16000	0.625mV	Δ	
		User range	-4000 to 4000	0.375mV	-12000 to 12000	0.333mV		
		settings						
	Current	0 to 20mA	0 to 4000 -4000 to 4000	5μΑ	0 to 12000	1.66µA		
		4 to 20mA		4μΑ		1.33µA		
		User range settings		1.37µA		1.33µA		
		•			•			

Item	A60MX					
Overall accuracy	460MX ±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-S3, V2-YS3A					
Internal current consumption (5VDC)	0.65A					
Weight	0.55kg					

	Q68ADV			C	Q68ADI		Compatibility	Precautions for replacement	
			•						
	Norm	al resolution m	ode	High	n resolution mo	de			
		emperature			emperature				
Analog input		55°C	Ambient		55°C	Ambient			
range	With temperature	Without temperature	temperature	With temperature	Without temperature	temperature			
	drift	drift	25±5°C	drift	drift	25±5°C			
	compensation	compensation		compensation	compensation				
0 to 10V				±0.3%	±0.4%	±0.1%			
-10 to 10V				(±48 digits)	(±64 digits)	(±16 digits)		A60MX is the accuracy in respect to the full scale, and	
0 to 51/							0	Q68ADV/I is the accuracy in	
Voltage 1 to 5V							Ŭ	respect to maximum digital	
Users									output value.
range	±0.3%	±0.4%	±0.1%					•	
settings 0 to	(±12 digits)	(±16 digits)	(±4 digits)	±0.3%	±0.4%	±0.1%			
20mA				(±36 digits)	(±48 digits)	(±12 digits)			
4 to									
Current 20mA									
Users range									
settings									
	±15V				_				
	-				±30mA		0		
								Consider replacement with	
		8 cha	nnels/modu	lle			Δ	multiple Q68ADV/I.	
			-				-		
Betv	veen the I/O f	erminal and p	orogrammal	ble controller	power supply	y:			
		•	oupler isola				0		
		Between ch		-isolated					
16 points							Δ	Q68ADV/I cannot set to 0 point	
(I/O assignment: intelligent 16 points) 18-point terminal block							×	with I/O assignment.	
0.3 to 0.75mm ²							×	Wiring change is required.	
	R1.25-3 (A s	olderless tern	ninal with sl	eeve can not	be used.)		×		
	0.64A				0.64A		0		
1	0.19kg			0.19kg			0		

5.2 A60MXRN

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

5.2.1 Performance comparison

ite	Item A60MXRN							
	Voltage	-10 to 0	to +10VDC (Input resistance value	e [.] 1MQ)				
Analog input	Current		o +20mADC (Input resistance valu					
Analog output v		-10 to 0 to +10VDC						
		Analog ir						
			Current (mA)	Analog output voltage (V)				
		Voltage (V) 0 to +10						
		0 to + 5						
		+ 1 to + 5	0 to +10					
		-10 to +10	+ 4 to +20 -20 to +20	0 10 + 10				
		- 5 to + 5	-20 to +20					
I/O characterist	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	Voltage		+15V					
Absolute	Voltage		±15V					
maximum input	Current		±30mA					
Analog input po	pints		16 channels/module					
Multiplexer eler	ment		Photo MOS relay Between the input terminal and programmable controller: photocoupler isolation					
Isolation metho	d							
		Between channels: photo MOS relay isolation						
Between channels dielectric withstand voltage		400	400VDC (accuracy guarantee 400VDC)					
Occupied I/O p	oints		16 points (treated as empty slots) nt setting is possible by I/O assign	ment)				
Connected tern	ninal	(0 poi	38-point terminal block					
			0.75 to 2mm ²					
Applicable wire	SIZE	(Appl	(Applicable tightening torque: 39 to 59N•cm)					
Applicable sold	erless terminal	V1	.25-3, V1.25-YS3A, V2-S3, V2-YS	3A				
Internal current (5VDC)	consumption	0.35A						
		/eight 0.56kg						

 \bigcirc : Compatible, \bigtriangleup : Partial change required, ×: Incompatible

				Compatibility	Precautions for replacement			
		-10 to 0 t	o +10VDC	(Input resis	stance value: 1MΩ	2)	0	
		0 to 20)mADC (In	Δ	The minus current cannot be input.			
				-				
	Input	Analog input range	Maximum 32bit	resolution 16bit	Digital output value (32bit)	Digital output value (16bit)		When using a range of -5 up to +5
		0 to 10V	156.3µV	312.6µV	(020.0)	(1001)		(with A60MX), With Q64AD-GH,
		0 to 5V	78.2µV	156.4µV				equivalent or more resolution value 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	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 A60MX), negative current can not be converted with
		0 to 20mA	312.5nA	625.0nA				Q64AD-GH.
	Current	4 to 20mA	250.0nA	500.0nA	0 to 64000	0 to 32000		Use conversion devices to convert
		User range settings (Uni-polar)	151.6nA	303.2nA				into a input range.
					±0.05%]		A60MXRN is the accuracy in respect to the full scale, and
	Refe	erence accuracy	Digital output value (32bit) ±32 digits Digital output value (16bit) ±16 digits			•	0	Q64AD-GH is the accuracy in respect to maximum digital output
	Temp	erature coefficient		±71.4ppm/°C (0.00714%/°C)				value.
				0				
				±30mA			0	
			4 cł	nannels/moo	dule		Δ	Consider replacement with multiple Q64AD-GH.
				-			-	
		Specific isolated area		Isolation method	Dielectric withstar voltage	nd Insulation resistance		
	Bet	veen the I/O terminal	and F	hotocoupler	, c		0	
	program	mable controller powe	er supply	isolation	1780VrmsAC/3 cyc			
	Be	etween analog channe	els	Transformer isolation	(Altitude 2000m)) 10M Ω or more		
		(1/0	D assignm	Δ	Q64AD-GH cannot set to 0 point with I/O assignment.			
	18-point terminal block 0.3 to 0.75mm ² R1.25-3 (A solderless terminal with sleeve can not be used.)						×	
							×	Wiring change is required.
							×	
								The recalculation of internal
				0.89A			Δ	current consumption [5VDC] is required.
	1			1	1			

5.3 A60MXR

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

5.3.1 Performance comparison

lte	em		A60MXR					
	Voltage	-10 to 0	to +10VDC (Input resistance value: 1	ΜΩ)				
Analog input			-20 to 0 to +20mADC	,				
0.1	Current		(Input resistance value: 250Ω)					
Analog output	voltage		-10 to 0 to +10VDC					
Analog output voltage		Analog ir	Analog output					
		Voltage (V)	Current (mA)	voltage (V)				
		0 to +10						
		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					
I/O characterist	tics	0 to +10	0 to +20	0 to + 5				
		0 to + 5	0 to +20	0 10 + 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 10 +10				
		-10 to +10	-20 to +20					
		- 5 to + 5	-20 to +20	- 5 to + 5				
Absolute maximum input	Voltage		±15V ±30mA					
· · ·								
Analog input po		16 channels/module						
Multiplexer eler	ment	Mercury plunger relay						
Isolation metho	bd	Between the input terminal and programmable controller: photocoupler isolation Between channels: mercury plunger relay isolation						
		Detweer	r channels, mercury plunger relay 150					
Detueerst								
Between chanr dielectric withst		500	OVDC (accuracy guarantee 500VDC)					
	tand voltage							
<u> </u>	• •		16 points (treated as empty slots)					
Occupied I/O points			nt setting is possible by I/O assignme	nt.)				
Connected terminal			38-point terminal block					
			0.75 to 2mm ²					
Applicable wire	e size	(Applicable tightening torque: 39 to 59N•cm)						
Applicable sold	lerless terminal		.25-3, V1.25-YS3A, V2-S3, V2-YS3A	· · · · · · · · · · · · · · · · · · ·				
Internal current (5VDC)	t consumption		0.5A					
Weight			0.6kg					
			3					

 \bigcirc : Compatible, \bigtriangleup : Partial change required, ×: Incompatible

-10 to 0 to +10VDC (hput resistance value: 1MC) ○ 0 to 20mADC (hput resistance value: 2500) △ The minus current cannot be input. imput Addot participation of the bits Output value Output value imput Addot participation Output value Output value Output value imput Addot participation Output value Output value Output value 0 to 20mADC (hput resistance value: 2500) △ The minus current cannot be input. imput Addot participation Output value Output value 0 to 20mADE (hput resistance value: 2500) 0 to 32000 Imput value Output value imput resistance value: 780,000 O to 2000 Imput value Output value Output value 0 to 2000 O to 2000 Imput value Output value Output value Output value 0 to 2000 O to 2000 Imput value Output va								: Partial change required, ×: Incompatible
0 to 20mADC (Input resistance value: 250(2)) Δ The minus current cannot be input. Imput Analog input range Maximum resolution Digital output value (2 to bis) With A60MXR, equivalent or more resolution value can be obtained by setting at the analog inputs, range of -10 up to 10/Migh resolution mode, and User range while the analog inputs are used at the range of -5 up to 5V on G64AD-GH. Uverage Uverage settings -10 b 10V 165 g/W 0 to 64000 0 to 32000 Uverage settings -10 b 10V 163 g/W 312 g/W -64000 to 64000 -32000 to 32000 Uverage settings -10 b 10V 151 g/W -64000 to 64000 0 to 32000 -2000K to 6400- 0 to 32000 -2000K to 6400- 0 to 32000 Uverage settings -10 big for output value (100-poter) 151 g/W -64000 to 64000 0 to 32000 -2000K to 6400- 0 to 50 converted with OG4AD-GH. -2000K to 6400- 0 to 50 converted with OG4AD-GH. Extense accuracy Digital output value (320) ±32 digits Digital output value (320) ±32 digits Digital output value (320) ±32 digits Temperature coefficient - - Specific isolated area 150 g/M 0 to 64000 16 digits	Ļ			Compatibility	Precautions for replacement			
Input Analog input range Addition Digital output value (32 bits) Output value (32 bits) Output value (16 bits) Tesolution value can be obtained by setting at the analog inputs are used at the range of -10 up to 10V/high resolution value (20 bits) Tage of -10 up to 10V/high resolution value (20 bits) Addition value (20 bits) Addition value (20 bits) Tage of -10 up to 10V/high resolution value (20 bits) Tage of -10 up to 10V/high resolution value (20 bits) Tage of -10 up to 10V/high resolution value (20 bits) Tage of -10 up to 10V/high resolution value (20 bits) Tage of -10 up to 10V/high resolution value (20 bits) Tage of -10 up to 10V/high resolution value (20 cits) Tage of -10 up to 10V/high resolution value (20 cits) Tage of -10 up to 10V/high resolution value (20 cits) Tage of -10 up to 10V/high resolution value (20 cits) Tage of -10 up to 10V/high resolution value (20 cits) Tage of -10 up to 10V/high resolution value (20 cits) Tage of -10 up to 10V/high resolution value (20 cits) Tage of -10 up to 10V/high resolution value (20 cits) Tage of -10 up to 10V/high resolution value (20 cits) Tage of -10 up to 10V/high resolution value (20 cits) Tage of -10 up to 10V/high resolution value (20 cits) Tage of -20 up to 20 vn to 2000 Tage of -20 up to 2000		-10 to 0 t	to +10VDC	C (Input resis	stance value: 1MΩ	2)	0	
Input Analog input range Maximum resolution (32 bit) Digital output value (32 bit) Digital output value (32 bit) With A60MXR, equivalent or more resolution value can be obtained by setting at the analog inputs, range of -10 up to 100/high resolution mode, and User range while the range putset (45 bit) With A60MXR, equivalent or more resolution value can be obtained by setting at the analog inputs, range of -10 up to 100/high resolution mode, and User range while the range of -10 up to 100/high resolution mode, and User range while the range of -20 up to 5V on (46-polar) User range settings (40 polar) 47.4µ 94.8µ -64000 -32000 to 32000 User range settings (40 polar) 74.1µ 94.8µ -64000 -32000 to 32000 User range settings (40 polar) 15.60.4 303.2nA 0 to 64000 -32000 to 32000 User range settings (40 polar) 15.60.4 303.2nA 0 to 64000 0 to 32000 User range settings (15.60.4 15.60.4 30.32.7A 0 to 64000 0 to 32000 -20000 kellow ob the accuracy in respect to maximum digital output value. 100 polarity (Use polarity (16 polarity) 15.60.4 30.3.7A 0 0 - 100 polarity (10 polarity) 15.60.4 30.3.7A 0 0 - -		0 to 20	DmADC (Ir	Δ	The minus current cannot be input.			
Input Marking methods Marking methods Digital output value (16 bits) Digital output value (16 bits) resolution value can be obtained by setting at the analog inputs, range of 10 up to 10/high resolution wate can be obtained (2 bits) Voitage 0 to 10V 156 3µV 126 8µV 0 to 6400 0 to 32000 0 to 32000 Voitage User range settings 474µV 94 8µV 0 to 64000 -32000 to 32000 0 to 32000 0 to 32000 User range settings 474µV 94 8µV -64000 to 64000 -32000 to 32000 0 to 200A CBANKR), negative current to not be converted with CB4AD-CH. User range settings 151.60 A 303.20 A 0 to 64000 0 to 32000 0 to 32000 -20mA (with A60MKR), negative current with CB4AD-CH. User range settings 151.60 A 303.20 A 0 to 64000 0 to 32000 0 to 32000 -20mA (with A60MKR), negative current with A60MKR), negative current with CB4AD-CH. Use conversion devices to convert into a input range. -20mA (with A60MKR), negative current into a input range. -20mA (with A60MKR), negative current into a input range. -20mA (with A60MKR), negative current into a input range. -20mA (with A60MKR), negative current con not be converted with CB4AD-CH. -20mA (with A60MKR), negative current co				-				
Imput Analog input range 32 bits Output value (32 bits) Output value (16 bits) Output value (16 bits) 0 to 10V 156.3V 752.4VV 132.6VV 10 to 5000 0 to 32000 0 to 50V 762.5VV 125.6VV 10 to 4000 0 to 32000 0 to 32000 0 to 2000 to 4000 47.4VV 94.8VV -64000 to 64000 -32000 to 32000 Octa 32000 0 to 2000 A 312.50.A 62.50.VA 10 to 64000 -32000 to 32000 -20.4VK (Mh AdWR), negative current can not be converted with OctAD-CH. 0 to 2000 A 312.50.A 62.50.0A 0 to 64000 0 to 32000 -20.000 to 6400.0 0 to 2000 A 312.50.A 62.50.0A 0 to 64000 0 to 32000 -20.000 to 6400.0 -20.000 to 6400.0 0 to 2000 A 151.60.A 303.20.A 0 to 6400.0 0 to 32000 -20.000 -20.000 to 6400.0 -20.0000 to 6400.0 -20.0000 to 6400.0			Maximun	n resolution	Digital	Digital		
$ \begin{array}{ c $	Input	Analog input range	32 bits	16 bits				by setting at the analog inputs,
$ \begin{array}{ c } \hline Votege & User range settings & 47.4 \mu & 94.8 \mu \\ \hline User range settings & 74.4 \mu & 94.8 \mu \\ \hline User range settings & 74.4 \mu & 94.8 \mu \\ \hline User range settings & 74.4 \mu & 94.8 \mu \\ \hline User range settings & 74.4 \mu & 94.8 \mu \\ \hline User range settings & 74.4 \mu & 94.8 \mu \\ \hline User range settings & 74.4 \mu & 94.8 \mu \\ \hline User range settings & 74.4 \mu & 94.8 \mu \\ \hline User range settings & 74.4 \mu & 94.8 \mu \\ \hline User range settings & 74.4 \mu & 94.8 \mu \\ \hline User range settings & 15.6 nA & 303.2 nA \\ \hline User range settings & 15.6 nA & 30.2 nA \\ \hline User range settings & 15.6 nA & 30.2 nA \\ \hline User range settings & 15.6 nA & 30.2 nA \\ \hline User range settings & 15.6 nA & 30.2 nA \\ \hline User range settings & 15.6 nA & 30.2 nA \\ \hline User range settings & 15.6 nA & 30.2 nA \\ \hline User range settings & 15.6 nA & 30.2 nA \\ \hline User range settings & 15.6 nA & 30.2 nA \\ \hline User range settings & 15.6 nA & 30.2 nA \\ \hline User range settings & 15.6 nA & 30.2 nA \\ \hline User range settings & 15.6 nA & 30.2 nA \\ \hline User range setting & 15.6 nA & 30.2 nA \\ \hline User range setting & 15.6 nA & 30.2 nA \\ \hline User range setting & 15.6 nA & 30.2 nA \\ \hline User range setting & 15.6 nA & 30.2 nA \\ \hline User range setting & 15.6 nA & 30.2 nA \\ \hline Use$			· · · ·					
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		1 to 5V	62.5µV	125.0µV	0 to 64000	0 to 32000		while the analog inputs are used at
$ \begin{array}{ c c c c c } \hline \hline$	 Voltage		47.4µV	94.8µV			Δ	
User range settings (B-polar) 47.4µV 94.8µV 64000 532000<	41	-10 to 10V	156.3µV	312.6µV				
$ \begin{array}{ c c c c c } \hline \begin{array}{ c c c c } \hline \begin{array}{ c c } \hline \end{array} \\ \hline \begin{array}{ c c } \hline \end{array} $			47.4µV	94.8µV	-64000 to 64000	-32000 to 32000		+20mA (with A60MXR), negative
$ \begin{array}{ c c c c } \hline Current & User range setting \\ \hline Uni-polar) & 151.6nA & 303.2nA & 0 to 64000 & 0 to 32000 & Use conversion devices to convert into a input range. \\ \hline Uni-polar) & 151.6nA & 303.2nA & 0 to 64000 & 0 to 32000 & Use conversion devices to convert into a input range. \\ \hline Uni-polar) & 151.6nA & 303.2nA & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & $		0 to 20mA	312.5nA	625.0nA				
User range settings (Uni-polar) 151.6nA 303.2nA Dise conversion devices to convert into a input range. Image: settings (Uni-polar) 151.6nA 303.2nA A Image: settings (Uni-polar) ±0.05% Digital output value (32bit) ±32 digits Digital output value (32bit) ±32 digits Digital output value (16bit) ±16 digits A Image: settings (Image: settings) ±15V O Image: settings ±15V O Image: settings ±15V Image: settings O Image: settings ±15V Image: settings O Image: settings Consider replacement with multiple Q64AD-GH. Image: settings Image: settings	Current		250.0nA	500.0nA	0 to 64000	0 to 32000		
Lubs Lubs Reference accuracy Digital output value (32bit) ±32 digits Digital output value (16bit) ±16 digits o to the full scale, and Q64AD-GH is the accuracy in respect to maximum digital output value. Image: Constraint of the full scale, and Q64AD-GH is the accuracy in respect to maximum digital output value. o Consider replacement with multiple Q64AD-GH. Image: Constraint of the full scale and Q64AD-GH is the accuracy in respect to maximum digital output value. o Consider replacement with multiple Q64AD-GH. Image: Constraint of the full scale area isolation with or voltage Dielectric withstand voltage Insulation resistance o Image: Constraint of the full scale area isolation voltage Dielectric withstand voltage Insulation resistance o Image: Constraint of points programmable controller power supply isolation Ifopoints voltage footooupler (Attude 2000m) footooupler 1780/msAC/3 cycles footyDC, 10MQ or more O Image: Controller power supply isolation Ifopoints isolation footooupler (Attude 2000m) footooupler 1780/msAC/3 cycles footyDC, 10MQ or more O Image: Controller power supply isolation Image: Controller power supply isolation footooupler (Attude 2000m) footooupler (Attude 2000m) footooupler (Mittude 2000m) footooupler (Mittude 2000m) footooupler (Mittude 2000m) footooupler (Mittude 2000m) footooupler (Mittude 2000m) footoou			151.6nA	303.2nA				
Lubs Lubs Reference accuracy Digital output value (32bit) ±32 digits Digital output value (16bit) ±16 digits o to the full scale, and Q64AD-GH is the accuracy in respect to maximum digital output value. Image: Constraint of the full scale, and Q64AD-GH is the accuracy in respect to maximum digital output value. O Image: Constraint of the full scale, and Q64AD-GH is the accuracy in respect to maximum digital output value. Image: Constraint of the full scale, and Q64AD-GH is the accuracy in respect to maximum digital output value. O Consider replacement with multiple Q64AD-GH. Image: Constraint of the full scale area isolation working Dielectric withstand voltage Insulation resistance O Image: Constraint of the full scale area isolation voltage Dielectric withstand voltage Insulation resistance O Image: Controller power supply programmable controller power supply isolation Ifopoints voltage Image: Controller power supply for the power supply isolation Image: Controller power supply for the p								
Image: Digital output value (16bit) ±16 digits the accuracy in respect to maximum digital output value. Image: Digital output value (16bit) ±16 digits one of the accuracy in respect to maximum digital output value. Image: Digital output value (16bit) ±16 digits one of the accuracy in respect to maximum digital output value. Image: Digital output value (16bit) ±16 digits one of the accuracy in respect to maximum digital output value. Image: Digital output value (16bit) ±16 digits one of the accuracy in respect to maximum digital output value. Image: Digital output value (16bit) ±16 digits one of the accuracy in respect to maximum digital output value. Image: Digital output value (16bit) ±16 digits one of the accuracy in respect to maximum digital output value. Image: Digital output value (16bit) ±16 digits one of the accuracy in respect to maximum digital output value. Image: Digital output value (16bit) ±16 digits one of the accuracy in respect to maximum digital output value. Image: Digital output value (16bit) ±16 digits one of the accuracy in respect to maximum digital output value. Image: Digital output value (16bit) ±16 digits one of the accuracy in respect to maximum digital output value. Image: Digital output value (16bit) ±16 digits Image: Digital output value. Image: Digital output value (16bit) ±16 digits Image: Digital output value. Image: Digital output value. Image: Digital output value. Image: Digital output value. </td <td></td> <td></td> <td></td> <td></td> <td></td> <td>P - 9 -</td> <td></td> <td>• •</td>						P - 9 -		• •
Image: Temperature coefficient ±71.4ppm/°C (0.00714%/°C) maximum digital output value. ±15V O 4 channels/module Δ Specific isolated area Isolation method voltage Image: Specific isolated area Isolation Image: Specific isolated area Isolation Voltage resistance Between the I/O terminal and programmable controller power supply Photocoupler isolation 1780VmsAC/3 cycles 500VDC, 10MΩ or more Image: Specific isolated area 16 points Δ O Image: Specific isolated area 16 points Δ Image: Specific isolated area 0.3 to 0.75mm ² × Image: Specific isolated area 0.3 to	Refe	erence accuracy						the accuracy in respect to
1100000000000000000000000000000000000	Temp	erature coefficient						
±30mA O 4 channels/module Δ Consider replacement with multiple Q64AD-GH. - - - Specific isolated area Isolation method voltage Insulation resistance Between the I/O terminal and programmable controller power supply Photoccupler isolation 1780VrmsAC/3 cycles 500VDC, 10MΩ or more Between analog channels Transformer isolation 1780VrmsAC/3 cycles 500VDC, 10MΩ or more Q64AD-GH cannot set to 0 point with I/O assignment. 16 points Δ Q64AD-GH cannot set to 0 point with I/O assignment. Witring change is required. 0.3 to 0.75mm ² × Wiring change is required. 0.89A Δ The recalculation of internal current consumption [5VDC] is required.	Temp			•		0)]	
±30mA Consider replacement with multiple Q64AD-GH. - - - - Specific isolated area Isolation method Voltage resistance Between the I/O terminal and programmable controller power supply isolation 1780VrmsAC/3 cycles 500VDC, 10MΩ or more Between analog channels Transformer isolation (Attitude 2000m) 10MΩ or more 16 points Δ Q64AD-GH cannot set to 0 point with I/O assignment. (I/O assignment: intelligent 16 points) Δ Q64AD-GH cannot set to 0 point with I/O assignment. 0.3 to 0.75mm ² × Wiring change is required. R1.25-3 (A solderless terminal with sleeve can not be used.) × 0.89A Δ The recalculation of internal current consumption [5VDC] is required.								
4 channels/module Δ multiple Q64AD-GH. - - - Specific isolated area Isolation method Dielectric withstand voltage Insulation resistance Between the I/O terminal and programmable controller power supply Photocoupler isolation 1780VrmsAC/3 cycles (Altitude 2000m) 500VDC, 10MΩ or more Between analog channels Transformer isolation 1780VrmsAC/3 cycles (Altitude 2000m) 500VDC, 10MΩ or more Q64AD-GH cannot set to 0 point with I/O assignment. 16 points Δ Q64AD-GH cannot set to 0 point with I/O assignment. Δ 18-point terminal block × × 0.3 to 0.75mm ² × Wiring change is required. R1.25-3 (A solderless terminal with sleeve can not be used.) × The recalculation of internal current consumption [5VDC] is required.				±30mA			Ű	
Specific isolated area Isolation method Dielectric withstand voltage Insulation resistance Between the I/O terminal and programmable controller power supply Photocoupler isolation 1780VrmsAC/3 cycles 500VDC, 10MΩ or more O Between analog channels Transformer isolation 1780VrmsAC/3 cycles 500VDC, 10MΩ or more O Image: the transformer isolation Transformer isolation 1780VrmsAC/3 cycles 500VDC, 10MΩ or more O Image: the transformer isolation Transformer isolation 1780VrmsAC/3 cycles 500VDC, 10MΩ or more O Image: the transformer isolation Transformer isolation 1780VrmsAC/3 cycles 500VDC, 10MΩ or more O Q64AD-GH cannot set to 0 point with I/O assignment: Image: the transformer isolation 16 points Δ Q64AD-GH cannot set to 0 point with I/O assignment. Image: the transformer isolation 18-point terminal block × Wiring change is required. Image: the transformer isolation 0.3 to 0.75mm² × Wiring change is required. Image: the transformer isolation 0.89A Δ The recalculation of internal current consumption [5VDC] is required.			4 cl	nannels/moc	dule		Δ	
$ \begin{array}{ c c c c } \hline Specific isolated area & method & voltage & resistance \\ \hline Between the I/O terminal and photocoupler isolation & 1780VrmsAC/3 cycles & 500VDC, \\ \hline Between analog channels & Transformer isolation & (Altitude 2000m) & 10M\Omega or more \\ \hline & & & & & & & & \\ \hline & & & & & & & &$				-			-	
$ \begin{array}{ c c c c } \hline Specific isolated area & method & voltage & resistance \\ \hline Between the I/O terminal and photocoupler isolation & 1780VrmsAC/3 cycles & 500VDC, \\ \hline Between analog channels & Transformer isolation & (Altitude 2000m) & 10M\Omega or more \\ \hline & & & & & & & & \\ \hline & & & & & & & &$								
programmable controller power supply isolation 1780VrmsAC/3 cycles 500VDC, 10MΩ or more Solution Between analog channels Transformer isolation 1780VrmsAC/3 cycles 500VDC, 10MΩ or more Q64AD-GH cannot set to 0 point with I/O assignment. Image: Solution 16 points Δ Q64AD-GH cannot set to 0 point with I/O assignment. Image: Solution 18-point terminal block × Viring change is required. Image: Solution 0.3 to 0.75mm ² × Viring change is required. Image: Solution 0.89A 0.89A Δ The recalculation of internal current consumption [5VDC] is required.	$\frac{1}{2}$	Specific isolated area	I					
programmable controller power supply isolation 1780VrmsAC/3 cycles (Altitude 2000m) 500VDC, 10MΩ or more Solver more Between analog channels Transformer isolation (Altitude 2000m) 10MΩ or more Q64AD-GH cannot set to 0 point with I/O assignment. Image: Control of the points Image: Control of the points Δ Q64AD-GH cannot set to 0 point with I/O assignment. Image: Control of the point of the points Image: Control of the point of the points X X Image: Control of the point	Bet	ween the I/O terminal	and	Photocoupler			0	
Between analog channels isolation A Q64AD-GH cannot set to 0 point with I/O assignment. 16 points △ Q64AD-GH cannot set to 0 point with I/O assignment. 18-point terminal block × 0.3 to 0.75mm² × R1.25-3 (A solderless terminal with sleeve can not be used.) × 0.89A △ The recalculation of internal current consumption [5VDC] is required.	program	mable controller powe	er supply		-			
Image: Construction of the construc	В	etween analog channe	els	s				
Image: Construction of the internal of the inte				16 points				Q64AD-GH cannot set to 0 point
0.3 to 0.75mm ² × Wiring change is required. R1.25-3 (A solderless terminal with sleeve can not be used.) × 0.89A △ The recalculation of internal current consumption [5VDC] is required.		(1/0	O assignm	Δ	with I/O assignment.			
R1.25-3 (A solderless terminal with sleeve can not be used.) × 0.89A △ The recalculation of internal current consumption [5VDC] is required.								
0.89A The recalculation of internal current consumption [5VDC] is required.	0.3 to 0.75mm ²						×	Wiring change is required.
0.89A Description The recalculation of internal current consumption [5VDC] is required.		R1.25-3 (A so	Iderless te	×	1			
required.						,		The recalculation of internal
0.2kg				0.89A				current consumption [5VDC] is
∪.∠∧y U				0.2kg			0	

6 HIGH-SPEED COUNTER MODULE REPLACEMENT

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

Production disco	ontinuation		Transition to Q series
Product	Model	Model	Remarks (Restrictions)
High-speed counter	AD61	QD62-H01 ^{*1}	 External wiring : Terminal block wiring → Connector wiring Cable size is changed. Number of slots : Not changed Counting speed : Not changed Counting range : 24-bit unsigned binary (0 to 16777215) → 32-bit signed binary (-2147483648 to 2147483647) Review the program. Program : Occupied I/O points, I/O signals and buffer memory address are changed. Performance specifications change: Not changed Function specifications: Not changed
module	AD61-S1	QD62-H02 ^{*1}	 External wiring : Terminal block wiring → Connector wiring Cable size is changed. Number of slots : Not changed Counting speed : Not changed Counting range : 24-bit unsigned binary (0 to 16777215) → 32-bit signed binary (-2147483648 to 2147483647) Review the program. Program : Occupied I/O points, I/O signals and buffer memory address are changed. Performance specifications change: Not changed Function specifications: Not changed

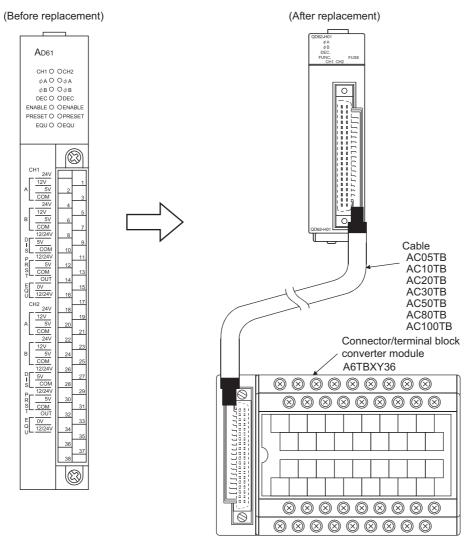
*1 The QD62-H01 is a module dedicated for replacing the AD61 with the Q series module. The QD62-H02 is a module dedicated for replacing the AD61-S1 with the Q series module. Both of them have same input filter system with the AD61 and AD61-S1.

⊠Point —

High	-speed counter module	series module AD61	Series module QD62 QD62-H01	ERNT-AQTD61								
	Froduct	series module		Conversion adaptor								
	Product	MELSEC-A/QnA	MELSEC-Q	Conversion adaptor								
	Co., Ltd.			itsubishi Electric Engineering								
	•	•		ectly to the Q series modules								
	•	al tool (a conversion ad	connector/terminal block aptor)	converter module.								
	• •			1-S1 to the system after								
		02: Wiring using a conn										
	AD61, AD61-S1: Wi	ring using a terminal blo	ock									
	QD62-H02.											
3)	Wiring to the module		61-S1 differs from that of	the OD62-H01 and								
2)			2, 147, 483, 647 (32-bit	signed binary)								
		o 16, 777, 215 (24-bit ur	• •									
				cement, review the program.								
	Counting range of the AD61 and AD61-S1 differs from that of the QD62-H01 and QD62-H02.											
2)	Counting range of th											
	•	ut filter system of the AD61 and AD61-S1 is the same as that of the QD62-H01 and QD62-H02. erefore, utilizing pulse generator such as existing encoder is possible.										
	•		is the same as that of the									
1)	Action to the replace	ed module										

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

(b) Using the connector/terminal block converter module (Replacing the AD61 with the QD62-H01)



For wiring of the connector/terminal block converter module, refer to the following manual. High-Speed Counter Module User's Manual (SH-080036)

* This manual is for the QD62(E/D); however, the QD62-H01/H02 use the same wiring method. For replacement with the QD62-H01/H02, refer to this manual.

6.2 AD61

6.2.1 Performance comparison

						O: Compati		tial change required, ×: Incompatible
	Iten	n	AD	61	QD62-H0)1	Compat- ibility	Precautions for replacement
Occ	upied I/O poir	nts	32 pc (I/O assignme) poin	nt: special 32	16 points (I/O assignment: intelligent 16 points)		Δ	*1
Nur	nber of chann	els		2 cha	nnels		0	
Οοι	inting speed s	witch settings	-		50KPPS	6	0	Set "2" at the intelligent function module switch setting.
		Phase			2-phase input		0	
	Count input signal	Signal level (∳A, ∳B)		5VDC 12VDC 24VDC	brace2 to 5mA		0	
		Counting	1-phase input	50KPPS	1 1	50KPPS	0	*2
		speed (Max.)	2-phase input	50KPPS	2-phase input	50KPPS	Ŭ	
		Counting range	24-bit unsig (0 to 16,7	-	32-bit signed (-2147483648 to 21	-	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 counter	er + ring counter fund	ction	0	
Performance specifications of 1 channels	Counter	Minimum count pulse width (set input rise time to 5µs or less. Duty ratio: 50%)		10 ^µ s			0	
ance s	Magnitude comparison	Comparison range	24-bit unsig	ned binary	32-bit signed	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	12/24VD0 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	Trans (open collec 12/24VD	ctor) output	Transistor (sink typ points/char 12/24VDC, 0.5, 2A/comm	nnel A/point,	0	
Inte (5V	rnal current co DC)	onsumption	0.3	3A	0.3A		0	
Wei	ght		0.5	kg	0.11kg		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.

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

t= 5μs: 50KPPS t=50μs: 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	Signal name	Device	Signal name	Device	Signal name	Device	Signal name	
No. X0	CH1 Counter value greater	No. Y0		No. X0	Module READY	No. 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	
X3	CH1 External preset request detection	Y3		X3	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	Not used	X7	CH1 Counter value small (Point No.2)	Y7	CH1 Coincidence signal No.2 reset command	
X8		Y8		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	
XB		ΥB		XB	CH2 External preset request detection	ΥB	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		Y1B	CH2 Count enable CH2 Present value read					
X1C		Y1C	request CH2 External preset					
X1D		Y1D	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	Dreast value actting		R/W	
(2)	(34)	Preset value write (Upper)	vv	1 33		Preset value setting	(H)		
3	35	Mode register	R/W	2	34	Present value	(L)	R	
4	36	Present value read (Lower and middle)	R	3	35		(H)		
(5)	(37)	Present value read (Upper)	ĸ	4	36	Coincidence output point set No.1	(L)		
6	38	Set value read/write (Lower and middle)	R/W	5	37		(H)	R/W	
(7)	(39)	Set value read/write (Upper)	r/w	6	38	Coincidence output point oot No 2	(L)	K/W	
Addre	ss in pa	arentheses in the above table indicates the	upper 8 bits	7	39	Coincidence output point set No.2			
of 24-l	bit data			8	40	Overflow detection flag		R	
				9	41	Counter function selection setting		R/W	
			10		42	Sampling/periodic setting		K/W	
				11	43	Sampling/periodic counter flag			
				12	44	Latch count value		1	
				13	45		(H)		
				14	46	Sampling count value	(L)		
				15	47		(H)	R	
				16	48	Periodic pulse count previous value	(L)		
				17	49	Periodic pulse count previous value	(H)		
				18	50	Periodic pulse count present value	(L)		
				19	51	renouic puise count present value	(H)		
				20	52	Ring counter minimum value	(L)		
				21	53		(H)	R/W	
				22 54				K/W	
				23	55	Ring counter maximum value	(H)		
				24	56				
				to	to	System area (Not used)	-	-	

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6.3 AD61S1

6.3.1 Performance comparison

						O : Compa	-	tial change required, ×: Incompatible
Item		ı	AD6	1S1	QD62	2-H02	Compat- ibility	Precautions for replacement
Occupied I/O points		points)		(I/O assignmen poir	16 points (I/O assignment: intelligent 16 points)		*1	
	nber of chann			2 cha	innels		0	
Cou sett	inting speed s ings	witch	-		10KI	PPS	0	Set "2" at the intelligent function module switch setting.
		Phase		1-phase input,	, 2-phase input		0	
	Count input signal	Signal level (ǫA, ǫB)		5VDC 12VDC 24VDC 24VDC			0	
		Counting	1-phase input	10KPPS	1-phase input	10KPPS		
		speed (Max.)	2-phase input	7KPPS	2-phase input	7KPPS	0	*2
Performance specifications of 1 channels Magnitucons and 2 channels Magnitucon		Counting range	24-bit unsig (0 to 16,7	-	32-bit sigr (-2147483648 t	•	Δ	On QD62-H02, as the value is used with 32-bit signed binary values, change of sequence program is required.
	Countor	Туре	UP/DOW	/N preset counter	0			
		Minimum count pulse width (set input rise time to 5µs or less. Duty ratio: 50%)		100 <i>µ</i> s 0 <i>µ</i> s 50 <i>µ</i> s phase input)	142 μs 71 μs 71 μs 71 μs 71 μs (2-phase input)		0	
mance	Magnitude comparison	Comparison range	24-bit unsigned binary 32-bit signed bin				0	
Perfor	between CPU and AD61/QD62 -H02	Comparison result	Set value < count value Set value = count value Set 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	-		5/12/24VD0			specifications.
	External output	Coincidence output	Transistor (op out) 12/24VD	out	points/c 12/24VDC,		0	
Inte (5V	rnal current co DC)	onsumption	0.3	3A	0.3	3A	0	
Wei	ght		0.5	kg	0.1	1kg	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.	-	0	
Sampling counter function	Counts the pulses that are 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	

6.3.3 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.

	AD6	1S1			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
X3	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	Not used	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	ΥB	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				
X13		V12	output enable command CH1 Down count command				
X13 X14		Y13 Y14	CH1 Down count command CH1 Count enable				
X14 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		Y1B	CH2 Count enable				
X1C		Y1C	CH2 Present value read request				
X1D		Y1D	CH2 External preset detection reset command				
X1E		Y1E					
X1F		Y1F	Not used				

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					
(De	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	Fleset value setting	(H)			
3	35	Mode register	R/W	2	34	Present value	(L)	R		
4	36	Present value read (Lower and middle)	R	3	35		(H)			
(5)	(37)	Present value read (Upper)	IX IX	4	36	Coincidence output point set No.1	(L)			
6	38	Set value read/write (Lower and middle)	R/W	5	37	Concidence output point set No. 1	(H)	R/W		
(7)	(39)	Set value read/write (Upper)	10.00	6	38	Coincidence output point set No.2	(L)	10.00		
Addre	ss in pa	arentheses in the above table indicates the	upper 8 bits	7	39	Concidence output point set No.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		1011		
				11	43	Sampling/periodic counter flag				
				12	44	Latch count value	(L)			
				13	45		(H)			
				14	46	Sampling count value	(L)			
				15	47		(H)	R		
				16	48	Periodic pulse count previous	(L)			
				17	49	value	(H)			
				18	50	Periodic pulse count present value	(L)			
				19	51		(H)			
				20	52	Ring counter minimum value	(L)			
				21	53	~	(H) (L)	R/W		
				22	54	Ring counter maximum value				
				23	55	-	(H)			
				24	56					
				to	to	System area (Not used)		-		
				31	63					

7.1 List of Positioning Module Alternative Models for Replacement

	uction inuation		Transition to Q series					
Product	Model	Model	Remarks (Restrictions)					
	AD70	QD73A1	 External wiring : Not changed^{*3} (An external power supply (±15VDC) is not required. The connector installation direction is reverse.) Number of slots : Changed (1 slot → 2 slots) Program : Buffer memory assignment and change of the setting method Performance specifications change: Upward-compatibility Function specifications: Partly changed (LED indication and function setting method) 					
	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.					
	AD75M1	QD75M1	 External wiring Connector and manual pulsar wiring are changed. Number of slots Not changed Program I/O signals, XY assignment, buffer memory assignment and different functions are changed. Performance specifications change: Upward-compatibility Function specifications: Partly changed 					
Positioning module ^{*2}	AD75M2	QD75M2	1) External wiring : Connector and manual pulsar wiring are changed. 2) Number of slots : Not changed 3) Program : I/O signals, XY assignment, buffer memory assignment and different functions are changed. 4) Performance specifications change: Upward-compatibility 5) Function specifications: Partly changed					
	AD75M3	QD75M4	1) External wiring : Connector and manual pulsar wiring are changed. 2) Number of slots : Not changed 3) Program : I/O signals, XY assignment, buffer memory assignment and different functions are changed. 4) Performance specifications change: Upward-compatibility 5) Function specifications: Partly changed					
	AD75P1-S3	QD75P1N ^{*1} (when an open collector is connected) QD75D1N ^{*1} (when a differential driver is connected)	 1) External wiring : Connector and manual pulsar wiring are changed. 2) Number of slots : Not changed 3) Program : 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)	1) External wiring : Connector and manual pulsar wiring are changed. 2) Number of slots : Not changed 3) Program : I/O signals, XY assignment, buffer memory assignment and different functions are changed. 4) Performance specifications change: Not changed. 5) Function specifications: Partly changed					

Production discontinuation			Transition to Q series
Positioning module ^{*2}	AD75P3-S3	QD75P4N ^{*1} (when an open collector is connected) QD75D4N ^{*1} (when a differential driver is connected)	 External wiring : Connector and manual pulsar wiring are changed. Number of slots : Not changed Program : I/O signals, XY assignment, buffer memory assignment and different functions are changed. Performance specifications change: Not changed. Function specifications: Partly changed

*1 The QD75PDN and QD75DDN are the upward-compatibility for the QD75PD and QD75DD 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 Production of AD71 (S1/S2/S7) has been discontinued since the end of October 2004. For details, refer to Technical Bulletin No.T12-0015.
- *3 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

Consider mounting the AD70D on the QA6 B extension base unit or the QD75M system is recommended.

7.3 AD72

No Q series alternative model is available.

Consider mounting two QD73A1 modules or the QD75 system is recommended.

When replacing with two QD73A1 modules, the interpolation function cannot be performed.

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

7.4.1 Performance comparison

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

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7 POSITIONING MODULE REPLACEMENT

				O : Com	patible,∆ : Parti	al change re	equired, ×: Incompatible		
Model	AD75P1-S3 AD75P2-S	3 AD75P3-S3	QD75P1N QD75D1N	QD75P2N QD75D2N	QD75P4N QD75D4N	Compat- ibility	Precautions for replacement		
			<absolute sy<br="">-214748364.8</absolute>	stem> to 214748364.	7 (µm)				
	<absolute system=""> -214748364.8 to 214748</absolute>	system> δ4.8 to 214748364.7 (μm)		I-214/4.83648 to 214/4.83647 (inch)					
	/-13421772.8 to 134217 -21474.83648 to 21474.	ŭ /	0 to 359.999	99 (degree)					
	/-1342.17728 to 1342.17 0 to 359.99999 (degree)	()	-2147483648	8 to 21474836	647 (pulse)				
	/0 to 359.99999 (degree -2147483648 to 214748 /-134217728 to 1342177	3647 (pulse)	<incrementa -214748364.8</incrementa 	l system> to 214748364.	7 (µm)				
	<pre><incremental system=""> -214748364.8 to 214748</incremental></pre>	ŭ /	-21474.8364	8 to 21474.83	8647 (inch)				
	/-13421772.8 to 13421772.7 (μm) -21474.83648 to 21474.83647 (inch) /-1342.17728 to 1342.17727 (inch) -21474.83648 to 21474.83647 (degree	33647 (inch)	-21474.8364	8 to 21474.83	647 (degree)				
Positioning range ^{*2}		. ,	-2147483648	3 to 21474836	647 (pulse)	0			
	/-1342.17728 to 1342.17727 (degree -2147483648 to 2147483647 (pulse) /-134217728 to 134217727 (pulse)		(INC mode)/	osition switchin cosition-speed	-				
	<in co<br="" speed-position="" switching="">0 to 214748364.7 (μm) /0 to 13421772.7 (μm) 0 to 21474.83647 (inch)</in>	. ,	control> 0 to 21474836	4.7 (µm)					
			0 to 21474.8	3647 (inch)					
	/0 to 1342.17727 (inch) 0 to 21474.83647 (degre	ee)	0 to 21474.8	3647 (degree)				
	/0 to 1342.17727 (degre 0 to 2147483647 (pulse)	,	0 to 2147483	647 (pulse)					
	/0 to 134217727 (pulse)		<in speed-po<br="">(ABS mode)</in>	sition switchi	ng control				
			0 to 359.999						
	0.01 to 6000000.00 (mm	/min)	0.01 to 2000	0000.00 (mm/	/min)				
	/0.01 to 375000.00 (mm	(min)							
	0.001 to 600000.000 (in	ch/min)	0.001 to 200	0000.000 (inc	:h/min)				
Speed command range *2	/0.001 to 37500.000 (inc					0			
opeed command range	0.001 to 600000.000 (de		0.001 to 200	0000.000 (de	gree/min)				
	/0.001 to 37500.000 (degree/min)								
	1 to 1000000 (pulse/s) /1 to 62500 (pulse/s)	1 to 1000000 (pulse/s)							
Machine OPR function (OPR method)	O(6 OPR met	nods)	0(6 OPR metho	ods)	0			
JOG operation	0			0		0			

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

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7 POSITIONING MODULE REPLACEMENT

O : Compatible, \bigtriangleup : Partial change required, ×: Incompatible

Item	Model	AD75P1-S3 AD75P2-S3 AD75P3-S3	QD75P1N QD75P2N QD75P4N QD75D1N QD75D2N QD75D4N	Compat- ibility	Precautions for replacement
Manual pulse function	generator	1 generator/axis	1 generator/module		 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.
Acceleration /deceleration processing	Automatic trapezoidal acceleration/ deceleration S-pattern acceleration/ deceleration	0	0	0	
Acceleration /deceleration time	No. of patterns Setting range	Acceleration time and deceleration time can be set independently. (4 patterns each) Changeover between 1 to 65535ms/1 to 8388608ms possible	Acceleration time and deceleration time can be set independently. (4 patterns each) 1 to 8388608ms	0	
	Sudden stop deceleration	Changeover between 1 to 65535ms/1 to 8388608ms possible	1 to 8388608ms	0	
Compensation		Electronic gears, backlash compensation, near pass ^{*3}	Electronic gears, backlash compensation, near pass ^{*3}	Δ	Refer to *3.
Error display		17-segment LED	Error LED	×	For details of diagnostic, use GX Developer.
History data s error, warning		Provided (4 types, 16 items/module)	Provided (3 types, 16 items/module)	0	The start history during error is integrated into the start history.
Data storage	destination	Flash ROM (battery-less backup)	Flash ROM (battery-less backup)	0	

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$O: Compatible, \triangle$	· Partial change	required x	Incompatible

			O : Com	patible, \triangle : Parti	ial change re	equired, ×: Incompatible
Model	AD75P1-S3 AD75P2-S3 AD75P3-S3	QD75P1N QD75D1N	QD75P2N QD75D2N	QD75P4N QD75D4N	Compat- ibility	Precautions for replacement
	10136-3000VE (Soldering type, supplied)	A6CON1 (Soldering type, straight-out type, sold separately) A6CON2 (Crimping type, straight-out type, sold separately) A6CON4 (Soldering type, straight-out/diagonal- out type, sold separately)				
Connection connector	10136-6000EL (Crimping type, sold separately)				×	As the connectors differ, wiring change is required. The connectors of QD75PDN/
Applicable wire size	10136-3000VE: 24 to 30 AWG (approx. 0.05 to 0.2 mm ²) 10136-6000EL:		11, 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		ected to open ected to differ 10m		0	
Internal current consumption (A) (5VDC)	0.7A or less	QD75P1N: 0.29A QD75D1N: 0.43A	QD75P2N: QD75P4N: 0.30A 0.36A QD75D2N: QD75D4N: 0.45A 0.66A		0	
Flash ROM write count	Max. 100,000 times	Max. 100,000 times			0	When QD75PDN/ QD75DDN 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	

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

Item	Model	AD75P1-S3 AD75P2-S3 AD75P3-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)			× (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.
devices			start or s	ommand signa peed-position able with para	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 I/O module			0	The connecting shape differs.			
devices (data setting, etc.)	AD75TU	0	x		×××		AD75TU cannot be used. Use GX Configurator-QP.			
GX Configurator GX Configura		GX Configurator-AP	GX Configurator-QP				Available GX Configurator differs.			

*1 With AD75PD-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 QD75PDN/QD75DDN.

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

with continuous running. (However, it will stop once.)

*2 Indicates the standard mode/stepping motor mode about AD75PD-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)
 QD75P□N/QD75D□N does not have address pass mode. When being asked for passing the positioning address, continue

7.4.2 Function comparison

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

When using the following function on AD75PD-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 QD75PDN/QD75DDN, there is no possible function for replacement.
Special start (stop)	Execute it separately for the start two times.
	In the QD75PDN/QD75DDN, 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 AD75PD-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 QD75PDN/QD75DDN, this
	function is deleted.
Chart biston , during among	The contents are the same as the start history.
Start history during errors	Therefore, the QD75PDN/QD75DDN stores only the start history.
Custom 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 AD75PD-S3, make sure that there is no operation problems when converted to QD75PDN/QD75DDN.

Changed functions		Change description					
5	1. The limit check of arc address is a		designated.				
	It is not carried out when a center point is designated.						
	2. The software stroke limit check during speed control is carried out in the following cases:						
	When the software stroke limit is ap		-				
	updated with Pr.21						
	• When the software stroke limit is a						
Software stroke limit	3. If an attempt is made to change the						
function	4. Error code change	red as an error and the current valu	e is not changed.				
	AD75PD-S3:						
	There are 3 types of errors for each	ch upper and lower stroke limit					
	(error code 509 to 512)						
		er 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	ted 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	nd frequency value calculated from	the speed limit value exceeds the				
Acceleration/deceleration	maximum command frequency of	the positioning module being used.					
speed control	2. Only two-word type (1 to 8388608	Bms) can be used as the setting valu	e 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	 "Stop (QD75 peripheral)" is added to the stop causes of Stop group 3 "sudden stop selection". Free cade 100 (Deripheral device stop during capacitien) is deleted. 						
	 Error code 100 (Peripheral device stop during operation) is deleted. "Programmable controller CPL error occurrence" is added to the stop causes of Stop group 2 Sudden stop. 						
	 Programmable controller CPU error occurrence" is added to the stop causes of Stop group 2 Sudden stop selection. 						
		AD75PD-S3					
READY signal (X0)	OFF	Normal (READY)	Not READY/WDT error				
	ON	Not READY/WDT error	Normal (READY)				
Manual pulse generator			· · ·				
operation	The No. of connectable manual pulse	generator is changed from Tgenera	ator/ faxis to rgenerator/ i module.				
Axis operation status	"Step stopped" is changed to "Stoppe	d" and "Step error occurring" is char	nged to "Error occurring".				
	• AD75Pロ-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						
	Even if the reference axis operates in reverse direction with interpolation, the control remains as the						
	continuous path control.						
		tion is the same as that of the AD75	۲Ц-53.)				
Near pass	For the continuous path control, only	•					
2-axis interpolation	Positioning address pass is not condu						
2-axis interpolation • 2-axis linear interpolation							
2-axis fixed-feed	The interpolation target axis can be ra	andomly set with a positioning identi	fier.				
Circular interpolation							

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 with the restart command.						
Command in-position	The command in-position width is ex	panded.				
function	• AD75P□-S3: 1 to 32767000					
TUTICIIOT	• QD75PDN/QD75DDN: 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 QD75PDN/QD75DDN, numbe	r of blocks has been change to 5 (700	00 to 7004).			
DIOCK Start Uala	(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 cor	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.			
		AD75PD-S3	QD75PDN/QD75DDN			
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			
	I	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.

Inj	out (X)		Outp	ut (Y)	
Signal name	AD75PD-S3	QD75P□N/ QD75D□N	Signal name	AD75PD-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	Y01 to Y03 Y18 to Y1F

* The ON/OFF statuses for READY are different between the QD75PDN/QD75DDN and AD75PD-S3.

	Not READY/WDT error	READY
QD75PDN/	OFF	ON
QD75D⊡N	OT	ON
AD75PD-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ロ-S3	AD75P□-S3 QD75P□N/QD7					DDN	
	Axis 1	Axis 2	Axis 3	Axis 1		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	
FI.7 Speed infit value	7	157	307	11		311	
Pr.8 Acceleration time 0	8	158	308	12		312	
	9	159	309	13 14		313	
Pr.9 Deceleration time 0	10	160 161	310 311	14	-	314 315	
	11	162	312	6		306	
Pr.10 Bias speed at start	13	163	313	7		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		319	
Pr.14 Software stroke limit lower limit value	18 19	168 169	318 319	20 21		320 321	
Pr.15 Software stroke limit selection	20	170	320	21		321	
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		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	186	336	36		336	
	37	187	337	37		337	
Pr.27 Acceleration time 2	38 39	188 189	338 339	38 39		338 339	
	40	190	340	40	190	340	
Pr.28 Acceleration time 3	41	191	341	41	191	341	
Pr.29 Deceleration time 1	42	192 102	342	42	192	342	
Y	43	193	343	43	193	343	

Item of AD72PELS3 AD72PELS3 COTSPELSION Axis 1 Axis 2 Axis 3		Buffer memory address							
Pr.30 Deceleration time 2 44 194 344 44 44 194 345 Pr.31 Deceleration time 3 46 195 345 45 195 345 Pr.32 JOG Speed limit value 48 198 348 44 199 349 49 199 349 49 199 349 49 199 349 49 199 349 49 199 349 49 199 349 49 199 349 49 199 349 49 199 349 49 199 349 49 199 349 49 199 349 49 199 349 49 199 349 49 199 349 44 194 344 51 201 351 201 351 201 351 201 351 51 201 352 52 202 352 55 205 355 55 205 356<	Item of AD75Pロ-S3				-	SP□N/QD75 Axis 2 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 220 221 222 223 224 225 226 227 228 229 230 231	D□N		
Pr.30 Deceleration time 2 45 195 346 45 195 346 Pr.31 Deceleration time 3 46 196 346 46 196 346 Pr.32 JOG Speed limit value 48 198 348 48 198 348 Pr.32 JOG operation acceleration time selection 50 200 350 50 200 350 Pr.33 JOG operation deceleration time selection 51 201 351 51 201 351 Pr.36 Scaceberation/deceleration process selection 52 202 352 52 202 355 Pr.36 Sudden stop selection 54 204 364 264 364 Pr.38 Stop group 1 sudden stop selection 57 205 355 55 205 355 Pr.30 Stop group 2 sudden stop selection 58 208 368 58 208 369 Pr.41 Postioning complets signal output time 59 209		Axis 1	Axis 2	Axis 3	Axis 1	Axis 2	Axis 3		
45 195 345 45 195 345 Pr.31) Deceleration time 3 46 196 346 48 198 344 Pr.32] JOG Speed limit value 48 198 348 44 199 347 47 197 347 Pr.32] JOG operation acceleration time selection 50 200 350 50 200 350 Pr.33] JOG operation acceleration process selection 51 201 351 51 201 351 Pr.33] JOG operation acceleration time selection 52 202 352 202 352 Pr.33] Statem proportion 53 203 353 53 203 353 Pr.33] Sudden stop deceleration time 54 204 354 54 204 354 Pr.34] Destioning comput 1 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 Desitioning complete signal output	Dr. 20 Deceleration time 2	44	194	344	44	194	344		
Pr.31 Deceleration time 3 47 197 347 47 197 347 [P:32] JOG Speed limit value 48 198 348 48 49 198 348 [P:33] JOG operation acceleration time selection 50 200 350 50 200 350 [P:34] JOG operation deceleration time selection 51 201 351 51 201 351 [P:36] Scaceleration/deceleration time selection 52 202 352 52 202 352 [P:36] Scateleration/deceleration time 54 204 354 54 204 354 [P:37] Sudden stop selection 56 205 355 55 205 356 [P:38] Stop group 1 sudden stop selection 57 207 357 57 207 357 [P:40] Stop group 2 sudden stop selection 58 208 358 58 208 358 [P:41] Stop group 3 sudden stop selection 60 210 360 60 210 360 [P:42] Mowable circular interpolation error width 61 211 361 61 211 361 [P:43]			195	345		195			
47 197 247 47 197 247 47 197 247 [Pr,32] JOG Speed limit value 48 198 348 48 198 348 [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,36] Acceleration/deceleration process selection 52 202 352 52 202 352 [Pr,36] Sepattern proportion 53 203 353 63 203 353 [Pr,36] Stop group 1 sudden stop selection 54 204 354 54 204 356 [Pr,38] Stop group 1 sudden stop selection 56 206 356 206 356 [Pr,41] Positioning complete signal output time 59 209 359 59 209 359 [Pr,42] Allowable circular interpolation error width 61 211 361 61 211 361	Pr 31 Deceleration time 3								
IP: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 acceleration process selection 52 202 352 52 202 352 [P:35] Acceleration/deceleration process selection 53 203 353 53 203 353 [P:35] Sudden stop deceleration time 54 204 354 54 204 354 [P:36] Stop group 1 sudden stop selection 57 207 357 57 207 357 [P:40] Stop group 3 sudden stop selection 58 208 356 56 206 366 56 206 365 [P:41] Positioning complete signal output time 59 209 359 59 209 359 [P:42] Altowable circular interpolation error width 60 210 360 60 211 361 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>									
[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 52 202 353 [Pr,36] Sepattern proportion 53 203 353 53 203 353 [Pr,36] Sepattern proportion 54 204 354 54 204 354 [Pr,36] Sepattern proportion 56 206 356 55 205 355 [Pr,38] Stop group 1 sudden stop selection 57 207 357 57 207 357 [Pr,41] Positioning complete signal output time 59 209 369 59 209 369 [Pr,43] External start function selection 60 210 366 - - - [Pr,44] Near pass mode selection for path control 66 216 366 - - - [Pr,45] OPR	Pr.32 JOG Speed limit value								
International and the state of the selection 52 202 352 52 202 352 [Pr.33] Acceleration/deceleration process selection 53 203 353 53 203 353 [Pr.33] Acceleration/deceleration time 54 204 354 54 204 354 [Pr.33] Sudden stop deceleration time 56 206 356 56 206 356 [Pr.33] Stop group 1 sudden stop selection 57 207 357 57 207 357 [Pr.4] Stop group 2 sudden stop selection 58 208 358 58 208 358 [Pr.4] Positioning complete signal output time 59 209 359 59 209 359 [Pr.42] Allowable circular interpolation error width 60 210 360 60 210 360 [Pr.43] External start function selection 62 212 362 62 212 362 [Pr.44] Near pass mode selection for path control 66 216 366 - - - <td>Pr.33 JOG operation acceleration time selection</td> <td></td> <td></td> <td></td> <td></td> <td>1</td> <td></td>	Pr.33 JOG operation acceleration time selection					1			
International data propertion 53 203 353 53 203 353 53 203 353 53 203 353 53 203 353 53 203 353 53 203 353 53 203 353 55 205 355 55 206 355 P7.33 Stop group 1 sudden stop selection 57 207 357 57 207 357 P7.40 Stop group 2 sudden stop selection 58 208 358 58 208 359 Pr.41 Stop group 3 sudden stop selection 60 210 360 60 210 360 Pr.42 Allowable circular interpolation error width 61 211 361 61 211 361 Pr.43 External start function selection 62 212 362 62 212 362 Selection 70 220 370 70 220 370 70 220 370 Pr.44<	Pr.34 JOG operation deceleration time selection	51	201	351	51	201	351		
Integration 54 204 354 54 204 354 54 204 354 55 205 355 157 207 355 155 205 355 157 207 357 157 208 358 158 208 358 158 208 358 158 158 208	Pr.35 Acceleration/deceleration process selection	52	202	352	52	202	352		
[Pr.37] 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.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 60 210 360 60 210 360 [Pr.43] External start function selection 62 212 362 62 212 362 [Pr.44] Near pass mode selection for path control 66 216 366 - - - [Pr.46] OPR direction 71 221 371 71 221 371 [Pr.46] OPR speed 74 224 374 74 224 374 [Pr.49] Creep speed	Pr.36 S-pattern proportion	53	203	353	53	203	353		
Pr:38 203 333 203 333 203 333 Pr:38 Stop group 1 sudden stop selection 56 206 356 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 60 210 360 60 210 360 (QD7SPEIN/QD75DEN): Pr.42 External start function selection 66 216 366 - - - Pr.44 OPr42 Allowable circular interpolation error width 66 216 366 - - - (QD7SPEIN/QD75DEN): Pr.42 External start function selection 70 220 370 70 220 370 Pr.45 OPR method 70 220 370 70 220 372 Pr.46 OPR speed 74		54	204	354	54	204	354		
Integrate Integrate Integrate Integrate 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 59 209 369 Pr.42 Allowable circular interpolation error width 61 211 361 61 211 361 Pr.43 External start function selection 62 212 362 62 212 362 (QD75PCIN/QD75DDN: Pr.42 External start function selection 66 216 366 - - - 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 speed 74 224 374 74 <t< td=""><td>Pr.37 Sudden stop deceleration time</td><td>55</td><td>205</td><td>355</td><td>55</td><td>205</td><td>355</td></t<>	Pr.37 Sudden stop deceleration time	55	205	355	55	205	355		
Integrate Image: Prior Detection and products Section	Pr.38 Stop group 1 sudden stop selection	56	206	356	56	206	356		
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	Pr.38 Stop group 2 sudden stop selection	57	207	357	57	207	357		
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	Pr.40 Stop group 3 sudden stop selection	58	208	358	58	208	358		
Pr.42 Allowable circular interpolation error width 61 211 361 61 211 361 Pr.43 External start function selection 62 212 362 62 212 362 (QD75PDIN/QD75DDN: Pr.42 External command function selection for path control 66 216 366 - - - 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 72 222 372 72 222 372 Pr.48 OPR speed 74 224 374 74 224 374 Pr.49 Creep speed 76 226 376 76 226 376 Pr.50 OPR retry 78 228 378 78 <td>Pr.41 Positioning complete signal output time</td> <td>59</td> <td>209</td> <td>359</td> <td>59</td> <td>209</td> <td>359</td>	Pr.41 Positioning complete signal output time	59	209	359	59	209	359		
Pr.43 External start function selection 61 211 361 61 211 361 (QD75PDLN/QD75DDN: Pr.42 External command function selection 62 212 362 62 212 362 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 72 222 372 72 223 373 Pr.48 OPR speed 74 224 374 74 224 374 Pr.49 Creep speed 76 226 376 76 226 376 Pr.50 OPR retry 78 228 378 78 228 378 Pr.51 OPR dwell time 79 229 379 79 229 379 <td>Pr 42 Allowable circular interpolation error width</td> <td>60</td> <td>210</td> <td>360</td> <td>60</td> <td>210</td> <td>360</td>	Pr 42 Allowable circular interpolation error width	60	210	360	60	210	360		
QD75PDIN/QD75DDN: Pr.42 External command function selection) 62 212 362 62 212 362 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 72 222 372 72 223 373 Pr.48 OPR speed 74 224 374 74 224 374 Pr.48 OPR speed 76 226 376 76 226 376 Pr.49 Creep speed 76 226 376 76 226 376 Pr.50 OPR retry 78 228 378 78 228 378 Pr.51 OPR dwell time 79 229 379 79 229 379		61	211	361	61	211	361		
Image: selection in the control 66 216 366 - - 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 72 222 372 72 222 373 Pr.46 OPR speed 74 224 374 74 224 374 Pr.49 Oreep speed 76 226 376 76 226 376 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	Pr.43 External start function selection								
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 72 222 372 72 222 373 Pr.48 OPR speed 74 224 374 74 224 374 Pr.49 OPR speed 76 226 376 76 226 375 Pr.49 Creep speed 76 226 376 76 226 376 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	(QD75PDN/QD75DDN: Pr.42 External command function	62	212	362	62	212	362		
Pr.45 OPR method 70 220 370 70 220 370 Pr.46 OPR direction 71 221 371 71 221 371 Pr.37 OP address 72 222 372 72 222 373 Pr.37 OP address 72 223 373 73 223 373 Pr.48 OPR speed 74 224 374 74 224 374 Pr.49 Orep speed 76 226 376 76 226 376 Pr.49 Creep speed 76 226 376 76 226 376 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	selection)								
Pr.46 OPR direction 71 221 371 71 221 371 Pr.37 OP address 72 222 372 72 222 373 Pr.48 OPR speed 74 224 374 74 224 373 Pr.48 OPR speed 75 225 375 75 225 376 Pr.49 Creep speed 76 226 376 76 226 376 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 s	Pr.44 Near pass mode selection for path control	66	216	366	-	-	-		
Pr.37 OP address 72 222 372 72 222 372 Pr.37 OP address 73 223 373 73 223 373 Pr.48 OPR speed 74 224 374 74 224 374 Pr.48 OPR speed 76 225 375 75 225 375 Pr.49 Creep speed 76 226 376 76 226 376 Pr.50 OPR retry 78 228 378 78 228 379 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.45 OPR method	70	220	370	70	220	370		
Pr.37 OP address 73 223 373 73 223 373 Pr.48 OPR speed 74 224 374 74 224 374 Pr.48 OPR speed 75 225 375 75 225 375 Pr.49 Creep speed 76 226 376 76 226 376 Pr.50 OPR retry 78 228 378 78 228 379 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.55 OP shift amount 84 234 384 84 234 384 Pr.56 OP shift amount	Pr.46 OPR direction	71	221	371	71	221	371		
173 223 373 173 223 373 Pr.48 OPR speed 74 224 374 74 224 374 Pr.49 Creep speed 75 225 375 75 225 375 Pr.49 Creep speed 76 226 376 76 226 376 Pr.50 OPR retry 78 228 378 78 228 377 Pr.50 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 <td< td=""><td>D- 27 OD address</td><td>72</td><td>222</td><td>372</td><td>72</td><td>222</td><td>372</td></td<>	D- 27 OD address	72	222	372	72	222	372		
Pr.48 OPR speed 75 225 375 75 225 375 Pr.49 Creep speed 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 Pr.56 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>									
73 223 373 73 223 373 Pr.49 Creep speed 76 226 376 76 226 377 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 deceleration time selection 82 232 382 82 232 383 Pr.54 OPR deceleration time selection 83 233 383 83 233 383 Pr.55 OP shift amount 84 234 384 84 234 384 Pr.56 OPR torque limit value 86	Pr 48 OPR speed								
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 ON 80 230 380 80 230 380 ON 81 231 381 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 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.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 ON 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 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.49 Creep speed								
Pr.51 OPR dwell time 79 229 379 79 229 379 Pr.52 Setting for the movement amount after near-point dog ON 80 230 380 80 230 380 ON 81 231 381 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 Pr.55 OP shift amount 86 236 386 86 236 386 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 50 OPR retry								
Pr.52 Setting for the movement amount after near-point dog 80 230 380 80 230 380 ON 81 231 381 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 Pr.55 OP shift amount 86 236 386 86 236 386 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									
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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.54 OPR deceleration time selection 83 233 383 83 233 383 Pr.55 OP shift amount 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 Pr.57 Speed designation during OP shift 88 238 388 88 238 388									
Pr.54 OPR deceleration time selection 83 233 383 83 233 383 Pr.55 OP shift amount 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 Pr.57 Speed designation during OP shift 88 238 388 88 238 388									
Pr.55 OP shift amount 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 Pr.57 Speed designation during OP shift 88 238 388 88 238 388									
Pr.55 OP shift amount 85 235 385 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.57 Speed designation during OP shift 88 238 388 88 238 388	Pr.55 OP shift amount								
	Pr.56 OPR torque limit value	86	236	386	86	236	386		
Pr.58 Dwell time during OPR retry 89 239 389 89 239 389	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		

Item of AD75P□-S3		Buffer memory address					
		AD75PD-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		400 to 507					
(QD75PDN/QD75DDN: Md.3 Start information)		462 to 537	1212 to 1287				
Md.8 Operation type		100 10 500					
(QD75PDN/QD75DDN: Md.4 Start No.)	2ro	463 to 538	1213 to 1288				
Md.9 Start Hour: minute	histo	101 1- 500					
(QD75PDN/QD75DDN: Md.5 Start Hour)	Start history	464 to 539	1214 to 1289				
Md.10 Start Second: 100 ms		465 to 540	1215 to 1290				
(QD75PDN/QD75DDN: Md.6 Start Minute: second)			1215101290				
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	ng e	544 to 619	-				
Md.15 Start Hour: minute	Start history during errors	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	ů.	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							
(QD75PDN/QD75DDN: Md.11 Axis error occurrence	listo	626 to 686	1295 to 1355				
(Hour))	Error history						
Md.22 Axis error occurrence Second: 100 ms	Ш						
(QD75PIN/QD75DIN: Md.12 Axis error occurrence		627 to 687	1296 to 1356				
(Minutes: second))							
Md.23 Error history pointer		688	1357				

		Buffer memory address				
Item of AD75P□-S3		AD75Pロ-S3	QD75P□N/QD75D□N			
		Common for axis 1, 2, 3	Common for axis 1, 2, 3, 4			
(Pointer number)		(0) to	o (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					
(QD75PDN/QD75DDN: Md.16 Axis warning		691 to 751	1360 to 1420			
occurrence (Hour))	Warning					
Md.27 Axis warning occurrence Second: 100 ms	Wa					
(QD75PDN/QD75DDN: Md.17 Axis warning		3692 to 752	1361 to 1421			
occurrence (Minutes: second))						
Md.28 Warning history pointer		753	1422			

			Buffer mem	ory address	ory address			
Item of AD75P□-S3	AD75P□-S3 QD75P□N/QD75D□N							
	Axis 1	Axis 2	Axis 3	Axis 1	Axis 2	Axis 3		
Md.29Current feed value	800	900	1000	800	900	1000		
	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		
Md.31 Feedrate	804 805	904 905	1004	804 805	904 905	1004		
Md.32 Valid M code	806	906	1005	808	908	1003		
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		
	810	910	1010	810	910	1010		
Md.36 Current speed	811	911	1010	811	911	1011		
	812	912	1012	812	912	1012		
Md.37 Axis feedrate	813	913	1013	813	913	1013		
Md 20 Speed position switching control positioning amount	814	914	1014	814	914	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		
Md.41 Target value	818	918	1018	818	918	1018		
	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	-	-	-		
	824	924	1020	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	-	AD75PD-S3		QD75PDN/QD75DDN						
	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				
	1154	1204	1254	1506	1606	1706				
Cd.15 New current value	1155	1205	1255	1507	1607	1707				
Cd.16 New speed value	1156	1206	1256	1514	1614	1714				
	1157 1158	1207 1208	1257 1258	1515 1516	1615 1616	1715 1716				
Cd.17 Speed change request	1159	1200	1259	1513	1613	1713				
Cd.18 Positioning operation speed override	1160	1209	1259	1513	1613	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	1214	1264	1526	1626	1726				
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 input magnification	1168	1218	1268	1522	1622	1722				
Cd.24 OPR return request flag OFF request	1169 1170	1219 1220	1269 1270	1523 1521	1623 1621	1723 1721				
	1170	1220	1270	1521	1021	1721				
Cd.25 External start valid	1171	1221	1271	1505	1605	1705				
(QD75PDN/QD75DDN: Cd.8 External command valid)	4470	4000	4070	4545	4045	4745				
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				
Cd.33 New acceleration time value	1184	1234	1284	1508	1608	1708				
	1185 1186	1235 1236	1285 1286	1509 1510	1609 1610	1709 1710				
Cd.34 New deceleration time value	1187	1230	1287	1510	1610	1710				
Cd.35 Acceleration/deceleration time change during speed	1188	1238	1288	1512	1612	1712				
change, enable /disable selection	1100	1200	.200	1012	1012					

ltem of AD75P□-S3				Buffer memory address												
				AD75P□-S3			Q			075PON/QD75DON						
				Axis 1		Axis 2		Axis 3		Axis 1		Axis 2		Axis 3		
Positioning data*1		.1 Operation pattern .2 Control system		1300		2300		3300		2000		8000		14000		
		a.3 Acceleration time No.a.4 Deceleration time No.														
	Da No.	5 M code/condition data		1301		2301		3301		2001		8001		14001		
		.8 Dwell time/JUMP tination positioning data No.	No.1	1302		2302		3302		2002		8002		14002		
	Emp	Empty Da.7 Command speed Da.5 Positioning address/		1303		2303		3303		2003		8003		14003		
	Da			1304 1305		2304 2305		3306 3307		2004 2005		8004 8005		14004 14005		
				1306		2306		3306		2006		8006		14006		
		novement amount		1307 1308		2307 2308		3307 3308		2007 2008		8007 8008		14007 14008		
	Da	Da.6 Arc address		1309		2309		3309		2009		8009		14009		
		No.2		1310 to 1319		2310 to 2319		3310 to 3319		2010 to 2019		8010 to 8019		14010 to 14019		
		No.3			1320 to 1329		2320 to 2329		3320 to 3329		2020 to 2029		8020 to 8029		14020 to 14029	
	to			to		to		to		to		to		to		
		No.100			2290 to 2299		3290 to 3299		4290 to 4299		2990 to 2999		8990 to 8999		14990 to 14999	
		Da.10 Shape	1st point				1000	1000	4050		00050	07000	07050			
	3	Da.11 Start data No.													00050	
	Start block data* ²	Da.12 Special start instruction		4300	4350	4550	4600	4800	4850	26000	26050	27000	27050	28000	28050	
		Da.13 Parameter														
		2nd point		4301	4351	4551	4601	4801	4851	26001	26051	27001	27051	28001	28051	
		3rd point to			4302 4352 to		4552 4602 to		4802 4852 to		26002 26052 to		27002 27052 to		28002 28052 to	
tion		50th point		4349	4399	4599	4649	4849	4899		26099		27099	28049	-	
orma		Da.14 Condition target						I				I				
art inf	Condition data	Da.15 Condition operator		4400		4650		4900		26100		27100		28100		
Positioning start information*3		Da.16 Address	No.1	4402 4403		4652 4653		4902 4903		26102 26103		27102 27103		28102 28103		
		Da.17 Parameter 1		4404 4405		4654 4655		4904 4905		26104 26105		27104 27105		28104 28105		
		Da.18 Parameter 2		4406		4656		4906		26106		27106		28106		
				4407		4657		4907		26107 26110 to		27107 27110 to		28107 28110 to		
	ŏ	No.2		4410 to 4419		4660 to 4669		4910 to 4919		26119		2711010		28119		
		No.3		4420 to 4429		4670 to 4679		4920 to 4929		26120 to 26129		27120 to 27129		28120 to 28129		
		to		to		to		to		to		to		to		
		No.10		4490 to 4499		4740 t	o 4749	4990 to 4999		26190 to		27190 to		28190 to		
										26199		27199		28199		

*1 With the QD75PDN/QD75DDN, the positioning data buffer memory addresses are Nos. 1 to 600.

*2 With the QD75PDN/QD75DDN, it is called [block start data].

*3 With the QD75PDN/QD75DN, 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	i		
Item of AD75P□-S3				AD75PD-S3		QD75PON/QD75DON			
			Axis 1	Axis 2	Axis 3	Axis 1	Axis 2	Axis 3	
	L L	Start No.8001	4500	4750	5000	-	-	-	
Positioning start	t lation	Start No.8002	4501	4751	5001	-	-	-	
information	Indirect desiana	to to	to	to	to	to	to	to	
	lnd	Ctart No. 0050	4549	4799	5049	-	-	-	
Dragrommable controller		Condition indoment to reat data	5050 to			30000 to			
Programmable controller	CPU	Condition judgment target data of the condition data							
memory area		of the condition data		5099			30099		
Target axis			5100			-			
Head positioning block N	۱o.		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 AD75PD-S3 and QD75PDN/QD75DDN.

				O : Compatible, \triangle : Partial change required
	ltem ^{*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: $4.7k\Omega \rightarrow 4.3k\Omega$ Response time: $4ms \rightarrow 1ms$	Δ	<when for="" machine="" opr="" the="" the<br="">near-point watchdog signal method is used> The input response time for the QD75PDN/QD75DDN is shorter than the A1SD75PD-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: $3.5k\Omega \rightarrow 4.7k\Omega$ (at input of 24V) $0.5k\Omega \rightarrow 0.62k\Omega$ (at input of 5V) Response time: $0.8ms \rightarrow 1ms^{*3}$ ON voltage : $2.5V \rightarrow 2.0V$ (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	
Juipul	Deviation counter clear	-	0	

*1 For the external start and in-position signal of which QD75P N/QD75D N does not have, they are not described.

*2 The column of interface specifications differences is described as the form, [Specifications of AD75P \Box -S3] \rightarrow [Specifications of QD75P \Box N/QD75D \Box N].

*3 The response time difference (0.2 ms) of AD75PD-S3 and QD75PDN/QD75DDN 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 QD75PDN/QD75DDN outputs an error and stops the OPR control.

7.5 AD75M1/M2/M3

7.5.1 Performance comparison

O : Compatible, △ : Partial chan						artial change	required, ×: Incompatible		
Item	Model	AD75M1	AD75M2	AD75M3	QD75M1	QD75M2	QD75M4	Compati- bility	Precautions for replacement
No. of control	axes	1	2	3	1	2	4	0	
No. of position	ing data items		600/axis ^{*1}			600/axis	•	0	
Position control	2-axis linear interpolation	×	0	0	×	0	0	0	
interpolation functions	2-axis circular interpolation	×	0	0	×	0	0	0	
	Position control		0			0			
	Speed control		0			0			
Positioning system	Speed- position switching control		0			0		0	
	Position- speed switching control								
Positioning range		-21474.83648 0 to 359.99999 -2147483648 <incremental s<br="">-214748364.8 -21474.83648 -21474.83648 -21474.83648</incremental>	to 214748364. to 21474.8364 9 (degree) to 2147483647 system> to 2147483647 to 2147483647 to 21474.83647 to 21474.83647 ition switching of 4.7 (μm) 647 (inch) 647 (degree)	7 (inch) (PLS) 7 (μm) 7 (inch) 7 (degree) (PLS)	-21474.83648 0 to 359.99999 -2147483648 <incremental s<br="">-214748364.8 -21474.83648 -21474.83648 -21474.83648</incremental>	to 214748364. to 21474.8364 9 (degree) to 2147483647 system> to 214748364. to 21474.8364 to 21474.8364 to 21474.8364 to 21474.83647 ition switching i4.7 (µm) 647 (inch) 647 (degree)	7 (inch) (PLS) 7 (μm) 7 (inch) 7 (degree) (PLS)	0	
Speed command range		0.01 to 600000.00 (mm/min) 0.001 to 600000.000 (inch/min) 0.001 to 600000.000 (degree/min) 1 to 1000000 (PLS/s)			0.01 to 2000000.00 (mm/min) 0.001 to 2000000.000 (inch/min) 0.001 to 2000000.000 (degree/min) 1 to 10000000 (PLS/s)			0	
Machine OPR function (OPR method) O(6 OPR methods)		O(4 OPR methods)		O(4 OPR methods)		Corresponding to the OP unpassed error is required. Return the motor more than one rotation once at the error and perform the OPR start again.			
JOG operation			0			0		0	

MELSEC

O : Compatible, \bigtriangleup : Partial change required, ×: Incompatible

						O : Cor	mpatible, \triangle : Pa	rtial change	required, ×: 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 processing	eleration deceleration		0		0				
			0			0			
Acceleration/	deceleration					Acceleration time and deceleration time can be set independently.			
deceleration action time						4 patterns each 1 to 8388608m		0	
Compensation		Electronic gears, backlash compensation, near pass*2			Electronic ge	ars, backlash c near pass ^{*2}	compensation,	Δ	Refer to *2.
Error display		17-segment LED				Error LED		×	For details of diagnostic, use GX Developer.
History data sto error, warning)		Provided (4 types, 16 items/module)			Provided (3 types, 16 items/module)			0	The start history during error is integrated into the start history.
Data storage d	estination	(ba	Flash ROM Ittery-less back	up)	Flash ROM (battery-less backup)			0	
Connection cor	nnector	(Soldering type, supplied) (Crimping type, sold separately)			A6CON1, A6CON4 (Soldering type, sold separately) A6CON2 (Crimping type, sold separately)			× As the connectors differ wiring change is	
Applicable wire size		(app) 1013	3000VE: 24 to 3 rox. 0.05 to 0.21 66-6000EL: 28 / pprox. 0.08mm	mm ²) AWG	A6CON3 (IDC type, sold separately) A6CON1, A6CON4: 0.3mm ² A6CON2: 24 to 28 AWG A6CON3: 28 AWG (twisted wire),			0	required. The connectors of QD75M⊟ is sold separately.
SSCNET connection type			-	Refer to Sec	30	AWG (single w			The connector
Maximum extension distance of SSCNET)m				configuration of bass differs.
Internal current			0.7A or less		QD75M1 : 0.40A	QD75M2 : 0.40A	QD75M4 : 0.40A	0	
consumption(A) (5VDC)		M	ax. 100,000 tim	es		ax. 100,000 tim	1	0	When QD75M ^{II} carries out the flash write 26 times from the sequence program, an error occurs. The error reset enables to perform the flash write.

MELSEC

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

Item	Model	AD75M1	AD75M2	AD75M3	QD75M1	QD75M2	QD75M4	Compati- bility	Precautions for replacement
I/O points		(I/O assig	32 points nment: special	32 points)	(I/O assign	32 points ment: intelligen	it 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	oosition switchir	ng signal	External command signal (External start or speed-position switching selectable with parameters)			0	
	Connection with peripheral devices	C	Direct connection		Connection via programmable controller CPU, Q corresponding serial communication module, Q corresponding MELSECNET/H remote I/O module			0	The connecting shape differs.
peripheral devices (data setting, etc.)	devices (data		Available			Unavailable		×	AD75TU cannot be used. Use GX Configurator- QP.
			X 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 QD75MD.

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

*2 The near pass function is valid only during the continuous path control. (AD75MD: Selected with parameters, QD75MD: Standard function)

QD75M□ 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 AD75MD -S3, change the program.

Deleted functions	Precautions for replacement					
Creep speed out of range error	With QD75MD, there is no the error code of the left column.					
(error code: 208)						
Fast machine OPR	With the Q75MD, there is no possible function for replacement.					
Special start (stop)	Execute it separately for the start two times.					
Indirect designation	In the QD75MD, 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 AD75MD, 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 QD75MD, this					
	function is deleted.					
Start history during errors	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					
(Module name, OS type, OS version)	information" of GX Developer.					
(module name, 03 type, 05 version)	(Refer to GX Developer Operating Manual.)					

(2) Changed function from AD75M1/AD75M2/AD75M3

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

Changed functions	Change description							
-	1. The software stroke limit check of arc address is carried out only when a sub point is designated.							
	It is not carried out when a center point is designated.							
	2. The software stroke limit check during speed control is carried out 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	ue					
		ge the current value but the desigr						
Software stroke limit function		e attempt is considered as an erro						
	changed.							
	4. Error code change							
	AD75MD:							
		r each upper and lower stroke limi	t. (error code 509 to 512)					
	QD75MD:							
		upper limit are integrated in to erro	or code 507.					
	Errors for the lower limit are in							
	Error codes 509 to 512 are de							
Current value changing M code		ignated new current value is out o						
function		alid during the positioning data cur						
Acceleration/deceleration speed		Bms) can be used as the setting va	alue for the acceleration/					
control	deceleration time.							
	1. "Peripheral side (emergency) stop" is deleted from the stop causes of Stop group 2 "sudden stop							
	selection".							
	"Test mode fault" in the stop causes of Stop group 3 "sudden stop selection" is changed to be in							
Stop process and restart after stop	the stop causes of Stop group 2 "sudden stop selection".							
positioning 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".							
		AD75MD	QD75M□					
READY signal (X0)	OFF	Normal (READY)	Not READY/WDT error					
	ON	Not READY/WDT error	Normal (READY)					
Manual pulse generator operation	The No. of connectable manual pulse generator is changed from 1generator/1axis to 1generator/1							
	module.							
Axis operation status	"Step stopped" is changed to "Sto	opped" and "Step error occurring" i	s changed to "Error occurring".					
	• AD75M□:							
	If the reference axis operates in	n reverse direction, the control is ir	nternally changed into the					
	continuous positioning control. (restart after deceleration stop)							
Continuous path control	• QD75MD:							
	Even if the reference axis operates in reverse direction with interpolation, the control remains as							
	the continuous path control.							
	(In single-axis operation, the op	peration is the same as that of the	AD75M□.)					
Neer peee	For the continuous path control, only the near pass function is available.							
Near pass	Positioning address pass is not co	onducted.						
2-axis interpolation								
 2-axis linear interpolation 	The interventetion terms to via serie		i - I 41 6					
 2-axis fixed-feed 	The interpolation target axis can i	pe randomly set with a positioning	identiner.					
Circular interpolation								
-	1. "Step stopped" is changed to	"Stopped" and "Step error occurrin	g" is changed to "Error occurring"					
	in the axis operations status p							
Step function		start information (02H) is deleted.						
	3. The step operation is restarted							

Changed functions	Change description						
	The command in-position width is	s expanded.					
Command in-position function	• AD75M□: 1 to 32767000						
	• QD75MD: 1 to 2147483647						
Positioning start No.	7004 to 7010 (block start designation	ation) and 8000 to 8049 (indirect de	esignation) are deleted.				
Block start data	With QD75MD, number of blocks	s has been change to 5 (7000 to 70	004).				
BIOCK Start data	(With the AD75M□, this data is called "Positioning start information".)						
Chart history	The configuration of start information and start No. is changed so that the start No. can be directly						
Start history	checked.						
		AD75MD	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"	Software stroke limits valid for Software stroke limits invalid fo						
č		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	put (X)		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			
		X02, X03	Netword	Y00 to Y0F	Y02, Y03			
Not used	X10 to X1F	X18 to X1F	Not used	Y1E to Y1F	Y18 to Y1F			

* The ON/OFF statuses for READY are different between the QD75MI / and AD75MI.

	Not READY/WDT error	READY
QD75M□	OFF	ON
AD75MD	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 AD75MD and QD75MD.

			Buffer mem	ory address		
Item of AD75M□	Axis 1	AD75MD Axis 2	Axis 3	Axis 1	QD75MD Axis 2	Axis 3
Pr.1 Unit setting	0	150	300	0	150	300
	1	151	301	2	152	302
Pr.2 No. of pulses per rotation (AP)	1	151	301	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
Pr.7 Speed limit value	6	156	306	10	160	310
·	7 8	157 158	307 308	11 12	161 162	311 312
Pr.8 Acceleration time 0	9	158	308	12	162	312
	10	160	310	13	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.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 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	33	-	-
Pr.25 Size selection for acceleration/ deceleration time	31	181	331	-	-	-
Function selection for speed-positioning	-	-	-	34	184	334
Dr 26 Appolaration time 1	36	186	336	36	186	336
Pr.26 Acceleration time 1	37	187	337	37	187	337
Pr.27 Acceleration time 2	38	188	338	38	188	338
	39	189	339	39	189	339
Pr.28 Acceleration time 3	40 41	190 101	340	40	190 101	340 341
	41	191	341	41	191	341

	Buffer memory address							
Item of AD75M□		AD75MD			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	193 194	343 344	43 44	193 194	343 344		
Pr.30 Deceleration time 2	45	194	345	44	194	345		
	46	196	346	46	196	346		
Pr.31 Deceleration time 3	47	197	347	47	197	347		
Pr.32 JOG Speed limit value	48	198	348	48	198	348		
	49	199	349	49	199	349		
Pr.33 JOG operation acceleration time	50	200	350	50	200	350		
selection								
Pr.34 JOG operation deceleration time	51	201	351	51	201	351		
selection								
Pr.35 Acceleration/deceleration process	52	202	352	52	202	352		
selection								
Pr.36 S-pattern proportion	53	203	353	53	203	353		
Pr.37 Sudden stop deceleration time	54	204	354	54	204	354		
Pr.37 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		
	60	210	360	60	210	360		
Pr.42 Allowable circular interpolation	61	210	361	61	210	361		
error width	01		001		2			
Pr.43 External start function selection								
(QD75MD: 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	66	216	366	_		_		
control	00	210	300	_		-		
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 ODD aroad	74	224	374	74	224	374		
Pr.48 OPR speed	75	225	375	75	225	375		
Pr.49 Creep speed	76	226	376	76	226	376		
	77	227	377	77	227	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		
Pr.55 OP shift amount	84	234	384	84	234	384		
	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			QD75MD			
	Axis 1	Axis 2	Axis 3	Axis 1	Axis 2	Axis 3		
Pr.57 Speed designation during OP shift	88 89	238	388 389	88 89	238	388		
Pr.58 Dwell time during OPR retry	09	239	309	09	239	369		
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		
4.00p								

	Buffer memory address							
ltem of AD75Mロ		QD75M□						
	Axis 1	Axis 2	Axis 3	Axis 1	Axis 2	Axis 3		
Maker setting	-	-	-	30135	30235	30335		
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	30357		
Maker setting	-	-	-	30158	30258	30358		
Maker setting	-	-	-	30159	30259	30359		
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□		AD75MD	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) t	to (15)			
Md.7 Start axis						
(QD75MD: Md.3 Start information)		462 to 537	1212 to 1287			
Md.8 Operation type		100 10 500	1010 1- 1000			
(QD75MD: Md.4 Start No.)	ory	463 to 538	1213 to 1288			
Md.9 Start Hour: minute	Start history	464 to 539	1214 to 1289			
(QD75MD: Md.5 Start Hour)	Star					
Md.10 Start Second: 100 ms		465 to 540	1215 to 1290			
(QD75MD: Md.6 Start Minute: second)		100 10 010	1213 (0 1230			
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	ing e	544 to 619	-			
Md.15 Start Hour: minute	/ duri	545 to 620	-			
Md.16 Start Second: 100 ms	Start history during errors	546 to 621	-			
Md.17 Error judgment	tart h	547 to 622	-			
Md.18 Start history pointer at error	S	623	-			
(Pointer number)		(0) t	to (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	tory	626 to 696	1295 to 1355			
(QD75MD: Md.11 Axis error occurrence (Hour))	Error history	626 to 686	129310 1333			
Md.22 Axis error occurrence Second: 100 ms						
(QD75MD: Md.12 Axis error occurrence		627 to 687	1296 to 1356			
(Minutes: second))						
Md.23 Error history pointer		688	1357			

		Buffer memory address					
Item of AD75M□	Item of AD75M□		QD75M□				
		Common for axis 1,2,3	Common for axis 1,2,3,4				
(Pointer number)		(0) to	o (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				
(QD75D: Md.16 Axis warning occurrence (Hour))	ing h	03110701	1300 10 1420				
Md.27 Axis warning occurrence Second: 100 ms	Warning						
(QD75MD: Md.17 Axis warning occurrence	-	692 to 752	1361 to 1421				
(Minutes: second))							
Md.28 Warning history pointer		753	1422				

Item of AD75M□		AD75MD			QD75M□		
	Axis 1	Axis 2	Axis 3	Axis 1	Axis 2	Axis 3	
Md.29 Current feed value	800 801	900 901	1000 1001	800 801	900 901	1000 1001	
	801	901	1001	801	901	1001	
Md.30 Machine feed value	803	903	1002	803	903	1002	
	804	904	1004	804	904	1004	
Pr.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	810 811	910 911	1010 1011	
Md.37 Axis feedrate	812	912	1012	812	912	1012	
Mu.37 Axis leediate	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	
	819	919	1019	819	919	1019	
Md.42 Target speed	820 821	920 921	1020 1021	820 821	920 921	1020 1021	
	822	922	1021	021	021	1021	
Md.43 OP absolute position	823	923	1023	-	-	-	
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			1000			1000	
parameter setting value	828	928	1028	828	928	1028	
Md.48 Start positioning data No. setting	000	000	4000	000	000	4000	
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							
(QD75MD: Md.41 Special start repetition	834	934	1034	832	932	1032	
counter)							
Md.54 Positioning data No. being	835	935	1035	835	935	1035	
executed							
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	
Md.100 OPR re-travel value	848 849	948 949	1048 1049	848 849	948 949	1048 1049	
Md.101 Real current value	850	950	1050	850	950	1050	
	851	951	1051	851	951	1051	

	Buffer memory address								
Item of AD75M□		AD75MD			QD75M□				
	Axis 1	Axis 2	Axis 3	Axis 1	Axis 2	Axis 3			
Md.102 Deviation counter value	852	952	1052	852	952	1052			
	853	953	1053	853	953	1053			
Md.103 Motor rotation	854	954	1054	854	954	1054			
	855	955	1055	855	955	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	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	975	1075			
		1	1	876	976	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 memory 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			
	1154	1204	1254	1506	1606	1706			
Cd.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	1207	1257	1516	1616	1716			
Cd.18 Positioning operation speed override	1159	1209	1259	1513	1613	1713			
	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	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									
(QD75MD: 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	1220	1280	1552	1652	1752			
Gu. 101 Torque output setting value	1100	1200	1200	1002	1002	1102			

	Buffer memory address								
Item of AD75M□		AD75MD		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	1520	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		-			1905				
Stop command processing for deceleration		_		1007					
stop selection		-		1907					
Servo amplifier data read		-		1553	1653	1753			

								Buffe	er mem	ory add	Iress				
		Item of AD75Mロ				AD7	5M□						5M□		
				Ax	is 1	Ax	is 2	Axi	s 3	Ax	is 1	Ax	is 2	Axi	s 3
	Da Da Da	 Control system Acceleration time No. 		13	800	2300 3300		20	00	80	00	140	000		
	Da.						~ ~		<u>.</u>						
	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	1302		02	33	02	20	02	80	02	140	002
data	Emp	ty			803		03	33			03		03	140	
Positioning data*1	Da.	7 Command speed			804 805		04 05	33 33			04 05		04 05	140 140	
Posit	Da.	5 Positioning address/			806 807		06 07	33 33			06 07		06 07	140 140	
	Da.				308 309		08 09	33			08		08	140	
		No.2			o 1319		o 2319	3310 to			o 2019		o 8019	140 ⁻ 140	I0 to
		No.3	132		o 1329	1329 2320 to 2329		3320 to	o 3329	3329 2020 to 2029		8020 to 8029		14020 to 14029	
		to		1	to	t	:0	t	0	1	0	1	to	to 14990 to	
		No.100		2290 t	o 2299	3290 t	o 3299	4290 to	o 4299	2990 t	o 2999	8990 t	o 8999	1499 149	
	Start block data ^{*2}	Da.10 Shape Da.11 Start data No. Da.12 Special start instruction	1st point	4300	4350	4550	4600	4800	4850	26000	26050	27000	27050	28000	28050
	art b	Da.13 Parameter 2nd point		4301	4351	4551	4601	4801	4851	26001	26051	27001	27051	28001	28051
	ぢ	3rd point		4302	4352	4552	4602	4802	4852					28002	
		to		1	to	t	:0	t	0	1	0	1	to	t	0
tion		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			100		50	49			100		100	281	
oning		Da.16 Address	No.1		4402 4403		52 53	49 49			102 103		102 103	28 ² 28 ²	
Positi	data	Da.17 Parameter 1		4404 4405			54 55	49 49			104 105		106 107	28 ² 28 ²	
	Condition data	Da.18 Parameter 2		4406 4407			56 57	49 49			106 107		106 107	28106 28107	
	Col	No.2			o 4419		o 4669	4910 to		26110 to		271	10 to	2811	0 to
		No.3		4420 t	o 4429	4670 t	o 4679	4920 to	o 4929	26119 26120 to 26129		27119 27120 to 27129		28119 28120 to 28129	
1		to		1	to	t	:0	t	0		0		to	t	0
		No.10		4490 t	o 4499	4740 t	o 4749	4990 to	o 4999		90 to 199		90 to 199	2819 281	

*1 With the QD75MD, the positioning data buffer memory addresses are Nos. 1 to 600.

*2 With the QD75MD, it is called "block start data".

*3 With the QD75MD, 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□			AD75MD		QD75M			
			Axis 1	Axis 2	Axis 3	Axis 1	Axis 2	Axis 3	
Desitioning		Start No.8001	4500	4750	5000	-	-	-	
Positioning	Indirect	Start No.8002	4501	4751	5001	-	-	-	
start information	designation	to	to	to	to	to	to	to	
mormation		Start No.8050	4549	4799	5049	-	-	-	
Drogrammal	ala controllar	Condition judgmont torget		5050		30000			
CPU memor	ble controller	Condition judgment target - data of the condition data -		to			to		
CFU Memor	y alea		5099			30099			
Target axis			5100			-			
Head position	ning block No	D.	5101			-			
No. of read/write data items			5102			-			
Read/write request			5103			-			
Read/write b	lock		5110 to 6109			-			

O : Compatible, \bigtriangleup : Partial change required

7.5.5 Interface specifications comparison with external devices

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

(1) Comparison of electrical specifications

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

The column of interface specifications differences is described as the form, [Specifications of AD75M \Box] \rightarrow [Specifications of QD75M \Box].

(2) Comparison of connector signal sequence

*

When using with QD75MD, change the connector and wiring.

	AD7	′5M□	QD75MD			
Name	Logic Logic switching by		Logic	Logic switching by		
	(Initial setting)	parameter	(Initial setting)	parameter		
Manual pulse generator A phase	Negative logic	Not allowed	Negative logic	Allowed		
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	Negative logic	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.

	AD75MD	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 QD75MD, the "external start signal" and "speed-position switching signal" are combined into the "external command signal/switching signal".

(3) For corresponding servo amplifier

The following shows corresponding condition to the servo amplifier of QD75MD.

O : Applicable \bigtriangleup : However, the cable change is required even applicable. $\textbf{\times}:$ Not applicable

Amplifier model name	AD75MD	QD75M⊡	Combination example of the positioning modules and servo amplifiers being replaced (However, the cable change is required even applicable.)
MR-Jロ-B	0	×	(1) QD75M□ + MR-J2S□-B
MIK-JU-D			(2) QD75MH□ + MR-J3□-B
MR-H□-B	0	Δ	(1) QD75M□ + MR-J2S□-B
МК-ПШ-В	0		(2) QD75MH🗆 + MR-J3🗆-B
MR-J2II-B	0	Δ	(1) QD75M□ + MR-J2S□-B
IVIR-JZU-D			(2) QD75MH🗆 + MR-J3🗆-B
MR-J2S□-B	0	0	

7.6 AD70

7.6.1 Performance specifications comparison

<hr/>	Model				ange required, ×: Incompatible	
Item		AD70	QD73A1	Compat- ibility	Precautions for replacement	
Number of co	ontrol axes	1 axis	1 axis	0		
Positioning	Capacity	1 data	1 data	0		
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		
Desitiening	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 operatio	n	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		×	x	0		

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

O : Compatible, \bigtriangleup : Partial change required, ×: Incompatible

Model	AD70	QD73A1	Compat- ibility	Precautions for replacement
Internal current consumption (5VDC)	5VDC 0.3A	5VDC 0.52A		The recalculation of internal current consumption (5VDC) is required.
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

O. Compatible, Not available							
	Function		Description	AD70	QD73A1	Precautions for replacement	
		Positioning	Positioning is executed from the current position to a specified	0	0	Refer to Section	
		control	position at a specified speed.	0	0	7.6.6.	
	Position	Ture shees	Positioning is executed to the address specified in				
control	control mode	Two-phase trapezoidal	"Da.2 Positioning address P1" at "Da.3 Positioning speed V1",	0	0		
	mouo	positioning control	then to the address specified in " $\boxed{Da.4}$ Positioning address P2" at	0	0		
Major		00111101	"Da.5 Positioning speed V2" by one positioning start signal.				
positioning		<u> </u>	Operation starts according to the positioning speed set beforehand				
control			by one start signal, then the operation switches to position control				
			by Speed-position switching command signal. If the operation				
	Speed-po	sition	stopped by Stop signal after the input of Speed-position switching	-	-	Refer to Section	
	control sw	itch mode	command signal, the positioning can be continued by Speed-	0	0	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.				
			Positioning is executed in the specified direction at specified				
			speed while a JOG operation command is on. Turning on the				
JOG opera	tion		signal starts operation at a specified speed and speed control	0	0		
			operation is continued until Stop signal is input.				
			A workpiece is returned to an original point following an OPR start				
OPR contro	ol		command from a CPU module, and the current value is corrected	0 0			
			to an OP address after the completion of OPR.	Ŭ	Ũ		
			This function multiplies the feedback pulse frequency from the	_	_		
Multiplicatio	on setting		pulse generator by 4, 2, 1, or 1/2.	0	0		
	<i>c i</i>		This function controls moving distance and speed by multiplying	_	_		
Electronic g	gear function	n	command pulse output.	0	0		
			This function clears the accumulated pulses in the deviation				
			counter. When the servomotor power is turned off due to an				
Deviation c	ounter clea	ar function	emergency stop during positioning, clearing the accumulated	0	0		
			pulses in the deviation counter prevents servomotor rotation at				
			power recovery.				
One ed also			This function forces to change speed from a program during	~	-	Refer to Section	
Speed chai	nge functio	n	positioning control or JOG operation.	0	0	7.6.6.	
Current val	ua ahanga	function	This function changes the current feed value to a specified value	~	0	Refer to Section	
Current val	ue change	TUNCTION	from a sequence program on the condition other than while BUSY.	0	0	7.6.6.	
			This function turns on In-position signal while the accumulated				
	function		pulse amount in the deviation counter is within the specified in-				
In-position	IUNCLION		position range. In-position signal can be used as the signal right	0	0		
			before positioning completion.				
Zoro/reir	diuotesert		This function adjusts analog voltage contained in accumulated	~	-	Refer to Section	
Zero/gain a	lajustment		pulses.	0	0	7.6.6.	

O: Compatible, --: Not available

.

Remarks

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

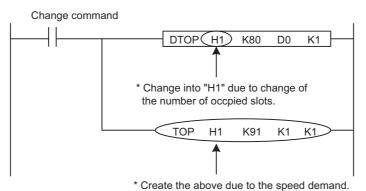
.

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.
	• AD70
	For Velocity/position axis travel distance change area, the value is reflected during speed control.
Speed-position control switch	Setting value: 0 to 2147483647 (valid within the stroke range)
mode (speed control	• QD73A1
operation)	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)
	• AD70
	The speed change is requested by writing a new speed value in Velocity change area of the buffer
	memory.
Speed change function	• 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}
	• AD70
	The current value is changed by writing a new address in Present value change area of the buffer
Current value change function	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).
	• AD70
	The adjustment is performed using the volumes for zero/gain adjustment.
	• QD73A1
	The adjustment is performed by either of following methods.
Zero/gain adjustment	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) Slide switches Rotation direction, accumulated pulse, multiplication setting, zero-return direction, zero-return mode, and zero/gain adjustment mode setting/clear 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)



Details of LEDs are shown in the table below.

*2

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		
Encoder phase A	φA	φA	
Encoder phase B	φB	φB	
Encoder phase Z	φZ	φZ	
BUSY	BUSY	BUSY	
Zero adjustment status		ZERO	The contents indicated with "ZERO" of the QD73A1 differ from the ones
		ZERO	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
End counter value	2"		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.
			Can be checked with an input signal "X12".
Zero-return request	ZERO		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	 QD73A1 						

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
		¥04	1	to	to
Absolute positioning start complete		X21		Y0F	Y19
Forward start complete			1	Y1B	Y1D
(for the incremental positioning and the		X22	***		to
speed-position control switching)			Use prohibited ^{*2}	Y1E, Y1F	Y1F
Reverse start complete			1		
•		X23			
(for the incremental positioning and the		723			Y2E, Y2F
speed-position control switching)					
Synchronization flag		X24			
Zero/gain adjustment data writing complete					
flag		X2A			
Zero/gain adjustment change complete flag		X2B			
Set value change complete flag		X2C			
Operating status of the speed-position					
control switch mode		X2D			
			4		
	X10	X25 to X29			
Use prohibited ^{*2}	to		1		
	X1F	X2E, X2F			
		I.	4		

*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.

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.

*2

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.

			Buffer memory address		
	Item		AD70	QD73A1	
	Stroke limit upper lim	it	0	0	
		int —	1	1	
	Stroke limit lower lim	it	2	2	
			3	3	
Fixed parameter		Numerator of command	4	4	
		pulse multiplication			
	Electronic gear	Denominator of			
		command pulse	5	5	
		multiplication			
	Speed limit value		20	20	
			21	21	
Variable parameter	Acceleration time		22	22	
	Deceleration time In-position range		23 24	23 24	
	Positioning mode		24	24 25	
	Fositioning mode		40	40	
	OP address		40	40	
			42	42	
	OPR speed		43	43	
OPR data			44	44	
	Creep speed		45	45	
	Setting for the mover	nent amount after near-point	46	46	
	dog ON		47	47	
	Positioning pattern		60	301	
		D	61	302	
	Positioning address I	F1	62	303	
	Positioning speed V ₁		63	304	
Positioning data			64	305	
	Positioning address I	Pa	65	306	
		2	66	307	
	Positioning speed V ₂		67	308	
			68	309	
	New current value		80	80	
			<u>81</u> 82	81	
	New speed value	New speed value		82	
			83	83	
	JOG speed (area)		84	84	
	Deviation counter cle	oar command	85	85	
Control change area	Analog output adjust		86 87	86 87	
			88	88	
	New speed-position	movement amount	89	89	
	Current value change	e request		90	
	Speed change reque			91	
				92	
	Analog output adjust	ment area 2		93	

		Buffer mer	nory address
	Item	AD70	QD73A1
	Zero/gain adjustment specification		94
Zero/gain adjustment	Zero/gain adjustment value specification		95
area	Factory default zero/gain adjustment value		96
	restoration request		90
	Current feed value	100	100
		101	101
	Actual current value	102	102
		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}
Monitor area	Deviation counter value (address)		107 ^{*2}
	Meuement emeunt effer neer neint des 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
	reeulate		115
	(Record 0) Error code		120
	(Record 0) Error occurrence (Year : Month)		121
Error history	(Record 0) Error occurrence (Day : Hour)		122
Error history	(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.

		\bigcirc : Compatible, \triangle : Partial change required			
Item		AD70	QD73A1	Compati- bility	Precautions for 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.
External input signal	Servo READY	0	0	0	
	Stop signal	0	0	0	
	Near-point dog signal	0	0	0	
	Upper limit signal	0	0	0	
	Lower limit signal	0	0	0	
	Speed- position switching command	0	Ο	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 command (analog signal)		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 specific	*3	
Mode setting	Hardware switch setting	Parameter setting of a CPU module ("I/O assignment" \rightarrow "Switch setting")	*4
LED	*5		
External wiring	*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	Wiring between the AD70 a	nd encoder	Wiring when the AD70 is re	placed to the QD73A1
1	OFF	Same direction	AD70	Phase A Phase B B Encoder	Phase A Phase B QD73A1	Phase A Phase B B Encoder
2		Reverse direction	A A Phase B AD70	Phase A Phase B Encoder	Phase Phase Phase B QD73A1	Phase A Phase B 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.

POSITION DETECTION MODULE REPLACEMENT

8.1 Position Detection Module Replacement

There are no alternatives for model A61LS, A62LS-S5 and A63LS position detection modules.

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9.1 External Dimensions

For external dimensions of modules shown in this handbook, refer to the Use's Manual for each module. For external dimensions of base units shown in this handbook, refer to the following.

MELSEC

Handbook	Manual number
Transition from MELSEC-A/QnA (Large Type) Series to Q Series Handbook	L-08043ENG
(Fundamentals)	L-00043ENG

Memo

APPENDICES

Appendix 1 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
Dower cumply module	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 2 Related Manuals

Appendix 2.1 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	
2	Handbook (Intelligent Function Modules)	L-00040LING	
3	Transition from MELSEC-A/QnA (Large Type) Series to Q Series	L-08048ENG	
	Handbook (Network Modules)	L-00048ENG	_
4	Transition from MELSEC-A/QnA (Large Type) Series to Q Series	L-08050ENG	_
4	Handbook (Communications)		
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	_
8	Transition from MELSEC-A/QnA Large Type Series to AnS/Q2AS Small	L-08064ENG	_
	Type Series Handbook	L-00004LING	
9	Transition of CPUs in MELSEC Redundant System Handbook	L-08117ENG	
	(Transition from Q4ARCPU to QnPRHCPU)	L-00117ENG	_

(3) Transition Examples

No.	Manual Name	Manual Number	Model Code
1	MELSEC-A/QnA Series Transition Examples	L(NA)08121E	-

(4) Others

No.	Manual Name	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	FA-A-0000	_

Appendix 2.2 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	ID-00273	13JA35
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-080190	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 2609	13JH86
17	AD75P1-S3/P2-S3/P3-S3 User's Manual	SH-3608	131480
18	Positioning Module Type A1SD75M1/M2/M3	10.00745	40.005
	AD75M1/M2/M3 User's Manual	IB-66715	13JH85
19	GX Configurator-AP Version 1 Operating Manual	IB-80031	13JN44

Appendix 2.3 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	
4	Signal Conditioning Function) User's Manual	311-060277	133131	
5	Digital-Analog Converter Module User's Manual	SH-080054	13JR02	
6	Channel Isolated Digital-Analog Converter Module User's Manual	SH-080281	13JR52	
7	Channel Isolated Analog-Digital Converter Module (With Signal	SH-080647ENG	13JR96	
'	Conditioning Function) User's Manual	3H-000047 ENG	133130	
8	Channel Isolated Thermocouple Input Module User's Manual	SH-080795ENG	13JZ26	
9	Thermocouple Input Module Channel Isolated Thermocouple/Micro	SH-080141	SH-080141	13JR30
9	Voltage Input Module User's Manual		133130	
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	

Appendix 2.4 Programming tool

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

Memo		

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

- (1) 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.

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Mitsubishi Programmable Controller

MITSUBISHI ELECTRIC CORPORATION

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