

Guide for Replacing High Performance Model QCPU with Universal Model QCPU

■ Preface

This manual describes how to replace a High Performance model QCPU with a Universal model QCPU.

■ Precautions on Operation

For safety operation of the programmable controller, carefully read "SAFETY PRECAUTIONS" in the user's manual for each product and use the equipment correctly with sufficient care for safety.

■ Related Manuals and Replacement Guides

The products covered in this guide have the following related manuals and replacement guides.

- QCPU User's Manual (Hardware Design, Maintenance and Inspection)
- QnUCPU User's Manual (Function Explanation, Program Fundamentals)
- QCPU User's Manual (Multiple CPU System)

- Transition from MELSEC-A/QnA (Large Type) Series to Q Series Handbook (Fundamentals)
- Transition from MELSEC-AnS/QnAS (Small Type) Series to Q Series Handbook (Fundamentals)
- Transition from MELSEC-A/QnA (Large Type) Series to Q Series Handbook (Intelligent Function Modules)
- Transition from MELSEC-AnS/QnAS (Small Type) Series to Q Series Handbook (Intelligent Function Modules)
- Transition from MELSEC-A/QnA (Large Type), AnS/QnAS (Small Type) Series to Q Series Handbook (Network Modules)
- Transition from MELSEC-A/QnA (Large Type), AnS/QnAS (Small Type) Series to Q Series Handbook (Communications)

■ Precautions before use

This guide explains the typical features and functions of the Q Series programmable controllers and does not provide restrictions and other information on usage and module combinations.

Before using the products, always read the product user manuals.

Mitsubishi Electric will not be held liable for damage caused by factors found not to be the cause of Mitsubishi Electric; opportunity loss or lost profits caused by faults in Mitsubishi Electric products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi Electric products; and to other duties.



For safe use

- To properly use the products given in this guide, always read the relevant manuals before use.
- The products have been manufactured as general-purpose parts for general industries, and have not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the products for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi.
- The products have been manufactured under strict quality control. However, when installing the products where major accidents or losses could occur if the products fail, install appropriate backup or fail-safe functions in the system.

Contents

1. Recommended Models	3
2. Advantage of Replacing with Universal Model QCPU	3
3. Comparison of CPU Module Specifications	3
4. Precautions for Replacement.....	4
5. Usable Products and Software.....	7
Appendix.....	8
Appendix 1 Module Specification Comparison.....	8

1. Recommended Models

The table below lists the current High Performance CPU models with their recommended upgrade models.

Table 1.1 Recommended upgrade models

Current model	Recommended model	
High Performance model QCPU	Q02(H)CPU	Q03UDCPU
	Q06HCPU	Q06UDHCPU
	Q12HCPU	Q13UDHCPU
	Q25HCPU	Q26UDHCPU

2. Advantage of Replacing with Universal Model QCPU

(1) Critical data is automatically protected from loss

Program and parameter files are automatically backed up to non-volatile Flash ROM (does not require a battery). This prevents the loss of programs and parameters that could occur in the case of battery replacement failure.

(2) Shortened system recovery time

The CPU module change function allows the user to create a comprehensive backup of all CPU information to a memory card.

Backing up the information periodically allows the user to keep the latest data on the memory card.

In the unlikely event of a CPU failure, the backup data can be used to quickly program a new CPU module.

(3) Increased number of failures that can be logged to system memory

Up to 100 failures can be logged to the CPU system memory without a memory card.

(4) Improved production time with ultra-high-speed processing

The results of improved basic operation processing speed (LD instruction: 9.5 ns) are shorter scan time, improved production time, and processing accuracy.

(5) High-speed, high-precision data processing

The floating point addition processing speed has been greatly reduced to 0.057 μ s.

Also, new double precision instructions have been added to reduce calculation errors.

These functions enable high-speed, high-precision operation processing of data.

(6) Increased capacity of standard memory

Standard RAM capacity has been increased to store up to 640k words of data (for the Q26UDHCPU) enabling storage of ever-increasing production and traceability data. This eliminates the need of a memory card and contributes to cost reduction.

Also, the capacity of the standard ROM has been increased to 4M bytes (for the Q26UDHCPU).

These improvements enable storage of additional program information such as device comments in the programmable controller CPU without suppressing the program memory.

(7) High-speed, high-accuracy machine control by multiple CPUs

Data transfers between multiple CPUs are processed in parallel with the sequence program at interrupt intervals that are synchronized with the motion controller's operation cycle (0.88ms).

This reduces production time and ensures high-speed, high-accuracy control.

3. Comparison of CPU Module Specifications

See the appendix on page 8 for the comparison of CPU module specifications.

4. Precautions for Replacement

This section provides precautions for replacing the High Performance model QCPU with the Universal model QCPU and the replacement methods.

* For details on replacement, refer to the following technical bulletin and manual.

- TECHNICAL BULLETIN

Method of replacing High Performance model QCPU with Universal model QCPU (FA-A-0001)

- QnUCPU User's Manual (Function Explanation, Program Fundamentals) SH-080807ENG, Appendix 3

(1) System configuration

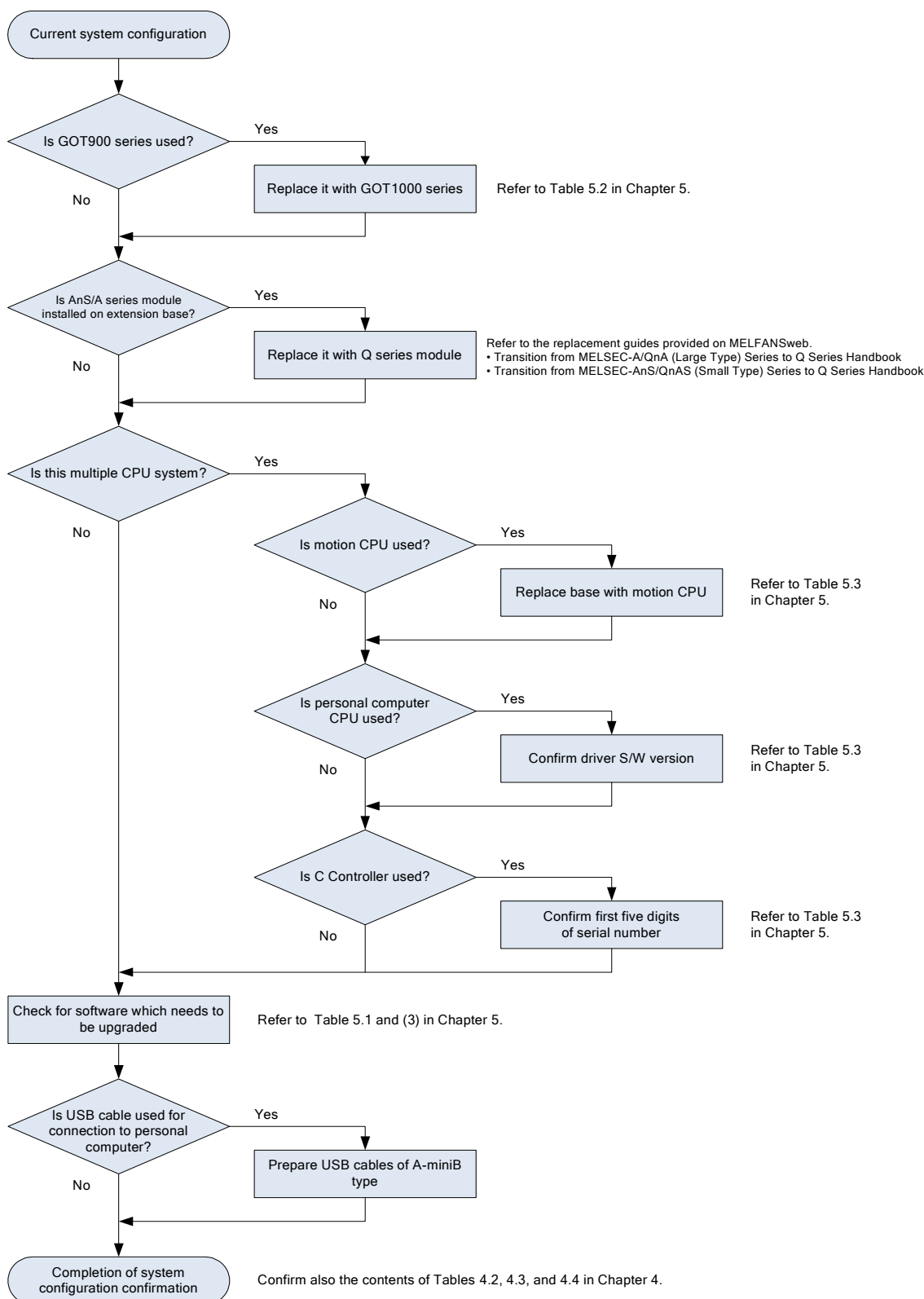


Table 4.1 Precautions and replacement methods

Item	Precaution	Replacement method	Reference
GOT	If a GOT900 Series is connected, it must be replaced.	Replace it with the GOT1000 series.	Table 5.2 in this guide
Use of AnS/A series module	If an AnS/A series module is installed on an extension base, the module must be replaced.	Replace it with a Q series module. Universal model QCPU will support QA extension bases (QA1S6□B, QA6□B) in the near future. (Contact us for details.)	<ul style="list-style-type: none"> • Transition from MELSEC-A/QnA (Large Type) Series to Q Series Handbook • Transition from MELSEC-AnS/QnAS (Small Type) Series to Q Series Handbook
Multiple CPU system	If the multiple CPU system is configured using the following motion CPUs, the motion CPUs must be replaced. <ul style="list-style-type: none"> • Q172CPUN(-T) • Q173CPUN(-T) • Q172HCPU(-T) • Q173HCPU(-T) 	Replace them with the following motion CPUs and base. <p>Motion CPU</p> <ul style="list-style-type: none"> • Q172DCPU • Q173DCPU <p>Base</p> <ul style="list-style-type: none"> • Q35/Q38/312DB *1 <p>*1: Q35DB will be released in the near future. (Contact us for details.)</p>	Chapter 2 in the QCPU User's Manual (Multiple CPU System) Table 5.3 in this guide
	If the multiple CPU system is configured using PC CPU PPC-CPU852 (MS), the driver software (PPC-DRV-02) must be upgraded to be compatible with the Universal model QCPU..	Upgrade the driver software.	
	If the multiple CPU system is configured using C Controllers Q06CCPU-V and Q06CCPU-V-B, the C Controllers must be compatible with Universal model QCPUs.	Replace the C Controllers with modules compatible with Universal model QCPUs.	
USB cable	The USB cables used must be replaced.	Replace the USB cables with A-miniB type cables.	List of peripherals cables, converters, connectable items in the technical bulletin (FA-A-0036)

(2) Program

Table 4.2 Precautions and replacement methods

Item	Precaution	Replacement method	Reference
Floating-point operation	Instructions for floating-point operations must be replaced if "Perform double-precision internal operations" is enabled.	Universal model QCPU has instructions for double precision floating-point operations. If double precision floating-point operations are required, please use these available instructions.	Appendix 5.4.1 in the QnUCPU User's Manual (Function Explanation, Program Fundamentals)
Latch setting	If a latch range is specified for internal user devices, the processing time is proportional to the number of latched device points.	The latch function of the Universal model QCPU is enhanced as follows: (1) Large-capacity file register (2) Writing/reading device data to the standard ROM (3) Latch range specification of internal user devices Use latch methods described in (1) to (3) above in accordance with the application.	Section 3.3 and Appendix 5.4.4 in the QnUCPU User's Manual (Function Explanation, Program Fundamentals)
Interrupt program	The interrupt pointer I49 for high-speed interrupt function is not supported.	Consider the use of interrupt pointers I28 to I31 for fixed scan interrupt.	Section 4.11 in the QnUCPU User's Manual (Function Explanation, Program Fundamentals)

(3) Drive and file

Table 4.3 Precautions and replacement methods

Item	Precaution	Replacement method	Reference
Boot file setting	If the standard ROM is used for booting, parameters must be changed.	Delete the boot file setting in the PLC parameter dialog box. Also, move the files that have been used for booting from the standard ROM to the program memory. Since the Universal model QCPU holds data in the program memory even when the battery voltage drops, boot file setting is not necessary.	Section 2.11 and Appendix 5.4.6 in the QnUCPU User's Manual (Function Explanation, Program Fundamentals)

(4) Switch found on the front of the CPU module

Table 4.4 Precautions and replacement methods

Item	Precaution	Replacement method	Reference
Switch found on the front of the CPU module	The operation of the RESET/RUN/STOP switch is different.	The RESET/STOP/RUN switch of the Universal model QCPU can be used to reset the CPU module and switch between STOP and RUN status.	Section 6.1.3 in the QCPU User's Manual (Hardware Design, Maintenance, and Inspection)
	This switch cannot clear latch data.	To clear latch data, use the remote latch clear operation of GX Developer/GX Works2.	
	Parameter-valid drive setting is not necessary.	The Universal model QCPU automatically determines the parameter-valid drive.	Section 2.1.2 in the QnUCPU User's Manual (Function Explanation, Program Fundamentals)

5. Usable Products and Software

(1) Software that need to be upgraded for compatibility with the Universal model QCPU

The following tables list the products that need to be upgraded for compatibility with the Universal model QCPU.

Download the latest software versions from MELFANSweb.

Table 5.1 Software to be upgraded (Personal computer boards)

Product	Model	Version of dedicated software package compatible with the Universal model QCPU *1		
		Q03UD/Q06UDHCPU	Q13UDH/Q26UDHCPU	
CC-Link IE Controller Network interface board	<ul style="list-style-type: none"> • Q80BD-J71GP21-SX • Q80BD-J71GP21S-SX 	No restrictions	Version 1.03D or later	
MELSECNET/H interface board	SI/QSI/H-PCF optical cable	<ul style="list-style-type: none"> • Q80BD-J71LP21-25 • Q80BD-J71LP21S-25 	Version 15R or later	Version 18U or later
		<ul style="list-style-type: none"> • Q81BD-J71LP21-25 	Version 19V or later	
	GI optical cable	<ul style="list-style-type: none"> • Q80BD-J71LP21G 	Version 15R or later	Version 18U or later
CC-Link system master/local interface board	Coaxial cable	<ul style="list-style-type: none"> • Q80BD-J71BR11 		
	<ul style="list-style-type: none"> • Q80BD-J61BT11N • Q81BD-J61BT11 	Version 1.02C or later	Version 1.05F or later	
		Version 1.06G or later		

*1: No restrictions on the board itself

Table 5.2 Software to be upgraded (GOT)

Product	Model	Version of GT Designer2 OS compatible with the Universal model QCPU *1	
		Q03UD/Q06UDHCPU	Q13UDH/Q26UDHCPU
GOT1000	<ul style="list-style-type: none"> • GT15□-□ • GT11□-□ 	Version 2.60N or later	Version 2.76E or later
	<ul style="list-style-type: none"> • GT10□-□ 	Version 2.76E or later	

*1: No restrictions on GOT itself

(2) CPU modules that can be used with the Universal model QCPU in a multiple CPU system

Table 5.3 CPU modules that can be used with the Universal model QCPU in a multiple CPU system

CPU module	Model	Applicable version		Restrictions
		Q03UD/Q06UDHCPU	Q13UDH/Q26UDHCPU	
Motion CPU	<ul style="list-style-type: none"> • Q172DCPU • Q173DCPU 	No restrictions		Applicable only when a multiple CPU high-speed main base unit (Q3□DB) is used
PC CPU	<ul style="list-style-type: none"> • PPC-CPU852 (MS) 	Driver S/W (PPC-DRV-02) version 1.01 or later	Driver S/W (PPC-DRV-02) version 1.02 or later	—
C Controller	<ul style="list-style-type: none"> • Q06CCPU-V • Q06CCPU-V-B 	No restrictions	Serial number (first five digits) "10012" or later	—
	<ul style="list-style-type: none"> • Q12DCCPU-V 	No restrictions		—
Process CPU	<ul style="list-style-type: none"> • Q02PHCPU • Q06PHCPU • Q12PHCPU • Q25PHCPU 	No restrictions		—

(3) Other software that need to be upgraded for compatibility with the Universal model QCPU

For compatibility with the Universal model QCPU, also upgrade software not listed in (1). Please download the latest software versions from MELFANSweb.

(4) Software not supported by the Universal model QCPU

The following software products are not supported by the Universal model QCPU.

- GX Explorer
- GX Converter
- GX RemoteService-I

Appendix

Appendix 1 Module Specification Comparison

(1) Q02(H)CPU and Q03UDCPU

Item		Current model		Recommended model
		Q02CPU	Q02HCPU	Q03UDCPU
Control method		Stored program repeat operation		
I/O control mode		Refresh mode (Direct access I/O is available by specifying direct access I/O (DX□, DY□))		
Programming language		Relay symbol language, logic symbolic language, MELSP3 (SFC), MELSP-L, function block, and structured text (ST)		
Processing speed (sequence instruction)	LD X0	79ns	34ns	20ns
	MOV D0 D1	237ns	102ns	40ns
Constant scan		0.5 to 2000 ms (Setting available in 0.5 ms unit) (Setting by parameters)		
Program size		28K steps (112K bytes)		30K steps (120K bytes)
Memory size	Program memory	112K bytes		120K bytes
	Memory card (RAM)	Size of the installed memory card (2M bytes max.)		Size of the installed memory card (8M bytes max.)
	Memory card (ROM)	Size of the installed memory card (Flash card: 4M bytes max., ATA card: 32M bytes max.)		
	Standard RAM	64K bytes	128K bytes	192K bytes
	Standard ROM	112K bytes		1024K bytes
	CPU shared memory	8K bytes		QCPU standard memory: 8K bytes Multiple CPU high speed transmission area: 32K bytes
Max. number of files stored	Program memory	28		124
	Memory card (RAM)	287 (when Q2MEM-2MBS is used)		319 (when Q3MEM-8MBS is used)
	Memory card (ROM)	Flash card	288	
		ATA card	512	511
	Standard RAM	3		4
	Standard ROM	28		256
Max. number of intelligent function module parameters	Initial setting	512		4096
	Refresh	256		2048
No. of times of writing data into program memory		-		Max. 100,000 times
No. of times of writing data into the standard ROM		Max. 100,000 times		
No. of I/O device points		8192 points		
No. of I/O points		4096 points		
No. of device points	Internal relay [M]	8192 points by default (changeable)		
	Latch relay [L]	8192 points by default (changeable)		
	Link relay [B]	8192 points by default (changeable)		
	Timer [T]	2048 points by default (changeable)		
	Retentive timer [ST]	0 points by default (changeable)		
	Counter [C]	1024 points by default (changeable)		
	Data register [D]	12288 points by default (changeable)		
	Extended data register [D]	-	0 points by default (changeable)	
	Link register [W]	8192 points by default (changeable)		
	Extended link register [W]	-	0 points by default (changeable)	
	Annunciator [F]	2048 points by default (changeable)		
	Edge relay [V]	2048 points by default (changeable)		
	Link special relay [SB]	2048 points	2048 points (changeable)	
	Link special register [SW]	2048 points	2048 points (changeable)	
	Step relay [S]	8192 points		
	Index register [Z]	16 points	Max. 20 points	
	Index register [Z] (32-bits modification specification of ZR device)	-	Max. 10 points	

Item			Current model		Recommended model		
			Q02CPU	Q02HCPU	Q03UDCPU		
No. of device points	File register	[R]	Standard RAM	32768 points	Up to 65536 points can be used by block switching in units of 32768 points.	Up to 98304 points can be used by block switching in units of 32768 points.	
			SRAM card (1M bytes)	Up to 517120 points can be used by block switching in units of 32768 points.			
			SRAM card (2M bytes)	Up to 1041408 points can be used by block switching in units of 32768 points.			
			SRAM card (4M bytes)	–	Up to 2087936 points can be used by block switching in units of 32768 points.		
			SRAM card (8M bytes)	–	Up to 4184064 points can be used by block switching in units of 32768 points.		
			Flash card (2M bytes)	Up to 1041408 points can be used by block switching in units of 32768 points.			
			Flash card (4M bytes)	Up to 1042432 points can be used by block switching in units of 32768 points.	Up to 2087936 points can be used by block switching in units of 32768 points.		
		[ZR]	Standard RAM	32768 points	65536 points: Block switching not required.	98304 points: Block switching not required.	
			SRAM card (1M bytes)	517120 points: Block switching not required.			
			SRAM card (2M bytes)	1041408 points: Block switching not required.			
			SRAM card (4M bytes)	–	2087936 points: Block switching not required.		
			SRAM card (8M bytes)	–	4184064 points: Block switching not required.		
			Flash card (2M bytes)	1041408 points: Block switching not required.			
			Flash card (4M bytes)	1042432 points: Block switching not required.		2087936 points: Block switching not required.	
	Pointer [P]			4096 points			
	Interrupt pointer [I]			256 points			
	Special relay [SM]			2048 points			
	Special register [SD]			2048 points			
	Function input [FX]			16 points			
	Function output [FY]			16 points			
	Function register [FD]			5 points			
Latch (power failure latch) range			L0 to 8191 (default) Latch range can be set for B, F, V, T, ST, C, D, and W. (Setting by parameters)				
RUN/PAUSE contact			One contact each can be set from X0 to 1FFF for RUN and PAUSE. (Setting by parameters)				
Clock function			Year, month, date, hour, minute, second, and day of the week (automatic leap year detection) Accuracy: -3.18 to +5.25s (TYP.+2.12s)/d at 0°C Accuracy: -3.93 to +5.25s (TYP.+1.90s)/d at 25°C Accuracy: -14.69 to +3.53s (TYP.-3.67s)/d at 55°C		Year, month, date, hour, minute, second, and day of the week (automatic leap year detection) Accuracy: -2.96 to +3.74s (TYP.+1.42s)/d at 0°C Accuracy: -3.18 to +3.74s (TYP.+1.50s)/d at 25°C Accuracy: -13.20 to +2.12s (TYP.-3.54s)/d at 5°C		
5 VDC internal current consumption			0.60A	0.64A	0.33A		

(2) Q06HCPU and Q06UDHCPU

Item		Current model	Recommended model	
		Q06HCPU	Q06UDHCPU	
Control method		Stored program repeat operation		
I/O control mode		Refresh mode (Direct access I/O is available by specifying direct access I/O (DX□, DY□))		
Programming language		Relay symbol language, logic symbolic language, MELSP3 (SFC), MELSP-L, function block, and structured text (ST)		
Processing speed (sequence instruction)	LD X0	34ns	9.5ns	
	MOV D0 D1	102ns	19ns	
Constant scan		0.5 to 2000 ms (Setting available in 0.5 ms unit) (Setting by parameters)		
Program size		60K steps (240K bytes)		
Memory size	Program memory	240K bytes		
	Memory card (RAM)	Size of the installed memory card (2M bytes max.)	Size of the installed memory card (8M bytes max.)	
	Memory card (ROM)	Size of the installed memory card (Flash card: 4M bytes max., ATA card: 32M bytes max.)		
	Standard RAM	128K bytes	768K bytes	
	Standard ROM	240K bytes	1024K bytes	
	CPU shared memory	8K bytes	QCPU standard memory: 8K bytes Multiple CPU high speed transmission area: 32K bytes	
Max. number of files stored	Program memory	60	124	
	Memory card (RAM)	287 (when Q2MEM-2MBS is used)	319 (when Q3MEM-8MBS is used)	
	Memory card (ROM)	Flash card	288	
		ATA card	512	511
	Standard RAM	3	4	
	Standard ROM	60	256	
Max. number of intelligent function module parameters	Initial setting	512	4096	
	Refresh	256	2048	
No. of times of writing data into program memory		–	Max. 100,000 times	
No. of times of writing data into the standard ROM		Max. 100,000 times		
No. of I/O device points		8192 points		
No. of I/O points		4096 points		
No. of device points	Internal relay [M]	8192 points by default (changeable)		
	Latch relay [L]	8192 points by default (changeable)		
	Link relay [B]	8192 points by default (changeable)		
	Timer [T]	2048 points by default (changeable)		
	Retentive timer [ST]	0 points by default (changeable)		
	Counter [C]	1024 points by default (changeable)		
	Data register [D]	12288 points by default (changeable)		
	Extended data register [D]	–	0 points by default (changeable)	
	Link register [W]	8192 points by default (changeable)		
	Extended link register [W]	–	0 points by default (changeable)	
	Annunciator [F]	2048 points by default (changeable)		
	Edge relay [V]	2048 points by default (changeable)		
	Link special relay [SB]	2048 points	2048 points (changeable)	
	Link special register [SW]	2048 points	2048 points (changeable)	
	Step relay [S]	8192 points		
	Index register [Z]	16 points	Max. 20 points	
Index register [Z] (32-bits modification specification of ZR device)	–	Max. 10 points		

Item			Current model	Recommended model	
			Q06HCPU	Q06UDHCPU	
No. of device points	File register	[R]	Standard RAM	Up to 65536 points can be used by block switching in units of 32768 points.	Up to 393216 points can be used by block switching in units of 32768 points.
			SRAM card (1M bytes)	Up to 517120 points can be used by block switching in units of 32768 points.	
			SRAM card (2M bytes)	Up to 1041408 points can be used by block switching in units of 32768 points.	
			SRAM card (4M bytes)	–	Up to 2087936 points can be used by block switching in units of 32768 points.
			SRAM card (8M bytes)	–	Up to 4184064 points can be used by block switching in units of 32768 points.
			Flash card (2M bytes)	Up to 1041408 points can be used by block switching in units of 32768 points.	
			Flash card (4M bytes)	Up to 1042432 points can be used by block switching in units of 32768 points.	Up to 2087936 points can be used by block switching in units of 32768 points.
		[ZR]	Standard RAM	65536 points: Block switching not required.	393216 points: Block switching not required.
			SRAM card (1M bytes)	517120 points: Block switching not required.	
			SRAM card (2M bytes)	1041408 points: Block switching not required.	
			SRAM card (4M bytes)	–	2087936 points: Block switching not required.
			SRAM card (8M bytes)	–	4184064 points: Block switching not required.
			Flash card (2M bytes)	1041408 points: Block switching not required.	
			Flash card (4M bytes)	1042432 points: Block switching not required.	2087936 points: Block switching not required.
	Pointer [P]			4096 points	
	Interrupt pointer [I]			256 points	
	Special relay [SM]			2048 points	
	Special register [SD]			2048 points	
	Function input [FX]			16 points	
	Function output [FY]			16 points	
Function register [FD]			5 points		
Latch (power failure latch) range			L0 to 8191 (default) Latch range can be set for B, F, V, T, ST, C, D, and W. (Setting by parameters)		
RUN/PAUSE contact			One contact each can be set from X0 to 1FFF for RUN and PAUSE. (Setting by parameters)		
Clock function			Year, month, date, hour, minute, second, and day of the week (automatic leap year detection) Accuracy: -3.18 to +5.25s (TYP.+2.12s)/d at 0°C Accuracy: -3.93 to +5.25s (TYP.+1.90s)/d at 25°C Accuracy: -14.69 to +3.53s (TYP.-3.67s)/d at 55°C	Year, month, date, hour, minute, second, and day of the week (automatic leap year detection) Accuracy: -2.96 to +3.74s (TYP.+1.42s)/d at 0°C Accuracy: -3.18 to +3.74s (TYP.+1.50s)/d at 25°C Accuracy: -13.20 to +2.12s (TYP.-3.54s)/d at 55°C	
5 VDC internal current consumption			0.64A	0.39A	

(3) Q12HCPU and Q13UDHCPU

Item		Current model	Recommended model	
		Q12HCPU	Q13UDHCPU	
Control method		Stored program repeat operation		
I/O control mode		Refresh mode (Direct access I/O is available by specifying direct access I/O (DX□, DY□))		
Programming language		Relay symbol language, logic symbolic language, MELSAP3 (SFC), MELSAP-L, function block, and structured text (ST)		
Processing speed (sequence instruction)	LD X0	34ns	9.5ns	
	MOV D0 D1	102ns	19ns	
Constant scan		0.5 to 2000 ms (Setting available in 0.5 ms unit) (Setting by parameters)		
Program size		124K steps (496K bytes)	130K steps (520K bytes)	
Memory size	Program memory	496K bytes	520K bytes	
	Memory card (RAM)	Size of the installed memory card (2M bytes max.)	Size of the installed memory card (8M bytes max.)	
	Memory card (ROM)	Size of the installed memory card (Flash card: 4M bytes max., ATA card: 32M bytes max.)		
	Standard RAM	256K bytes	1,024K bytes	
	Standard ROM	496K bytes	2048K bytes	
	CPU shared memory	8K bytes	QCPU standard memory: 8K bytes Multiple CPU high speed transmission area: 32K bytes	
Max. number of files stored	Program memory	124	252	
	Memory card (RAM)	287 (when Q2MEM-2MBS is used)	319 (when Q3MEM-8MBS is used)	
	Memory card (ROM)	Flash card	288	
		ATA card	512	511
	Standard RAM	3	4	
	Standard ROM	124	256	
Max. number of intelligent function module parameters	Initial setting	512	4096	
	Refresh	256	2048	
No. of times of writing data into program memory		–	Max. 100,000 times	
No. of times of writing data into the standard ROM		Max. 100,000 times		
No. of I/O device points		8192 points		
No. of I/O points		4096 points		
No. of device points	Internal relay [M]	8192 points by default (changeable)		
	Latch relay [L]	8192 points by default (changeable)		
	Link relay [B]	8192 points by default (changeable)		
	Timer [T]	2048 points by default (changeable)		
	Retentive timer [ST]	0 points by default (changeable)		
	Counter [C]	1024 points by default (changeable)		
	Data register [D]	12288 points by default (changeable)		
	Extended data register [D]	–	0 points by default (changeable)	
	Link register [W]	8192 points by default (changeable)		
	Extended link register [W]	–	0 points by default (changeable)	
	Annunciator [F]	2048 points by default (changeable)		
	Edge relay [V]	2048 points by default (changeable)		
	Link special relay [SB]	2048 points	2048 points (changeable)	
	Link special register [SW]	2048 points	2048 points (changeable)	
	Step relay [S]	8192 points		
	Index register [Z]	16 points	Max. 20 points	
	Index register [Z] (32-bits modification specification of ZR device)	–	Max. 10 points	

Item			Current model	Recommended model	
			Q12HCPU	Q13UDHCPU	
No. of device points	File register	[R]	Standard RAM	Up to 131072 points can be used by block switching in units of 32768 points.	Up to 524288 points can be used by block switching in units of 32768 points.
			SRAM card (1M bytes)	Up to 517120 points can be used by block switching in units of 32768 points.	
			SRAM card (2M bytes)	Up to 1041408 points can be used by block switching in units of 32768 points.	
			SRAM card (4M bytes)	-	Up to 2087936 points can be used by block switching in units of 32768 points.
			SRAM card (8M bytes)	-	Up to 4184064 points can be used by block switching in units of 32768 points.
			Flash card (2M bytes)	Up to 1041408 points can be used by block switching in units of 32768 points.	
			Flash card (4M bytes)	Up to 1042432 points can be used by block switching in units of 32768 points.	Up to 2087936 points can be used by block switching in units of 32768 points.
		[ZR]	Standard RAM	131072 points: Block switching not required.	524288 points: Block switching not required.
			SRAM card (1M bytes)	517120 points: Block switching not required.	
			SRAM card (2M bytes)	1041408 points: Block switching not required.	
			SRAM card (4M bytes)	-	2087936 points: Block switching not required.
			SRAM card (8M bytes)	-	4184064 points: Block switching not required.
			Flash card (2M bytes)	1041408 points: Block switching not required.	
			Flash card (4M bytes)	1042432 points: Block switching not required.	2087936 points: Block switching not required.
	Pointer [P]			4096 points	
	Interrupt pointer [I]			256 points	
	Special relay [SM]			2048 points	
	Special register [SD]			2048 points	
	Function input [FX]			16 points	
	Function output [FY]			16 points	
Function register [FD]			5 points		
Latch (power failure latch) range			L0 to 8191 (default) Latch range can be set for B, F, V, T, ST, C, D, and W. (Setting by parameters)		
RUN/PAUSE contact			One contact each can be set from X0 to 1FFF for RUN and PAUSE. (Setting by parameters)		
Clock function			Year, month, date, hour, minute, second, and day of the week (automatic leap year detection) Accuracy: -3.18 to +5.25s (TYP.+2.12s)/d at 0°C Accuracy: -3.93 to +5.25s (TYP.+1.90s)/d at 25°C Accuracy: -14.69 to +3.53s (TYP. -3.67s)/d at 55°C	Year, month, date, hour, minute, second, and day of the week (automatic leap year detection) Accuracy: -2.96 to +3.74s (TYP.+1.42s)/d at 0°C Accuracy: -3.18 to +3.74s (TYP.+1.50s)/d at 25°C Accuracy: -13.20 to +2.12s (TYP. -3.54s)/d at 55°C	
5 VDC internal current consumption			0.64A	0.39A	

(4) Q25HCPU and Q26UDHCPU

Item		Current model	Recommended model	
		Q25HCPU	Q26UDHCPU	
Control method		Stored program repeat operation		
I/O control mode		Refresh mode (Direct access I/O is available by specifying direct access I/O (DX□, DY□))		
Programming language		Relay symbol language, logic symbolic language, MELSAP3 (SFC), MELSAP-L, function block, and structured text (ST)		
Processing speed (sequence instruction)	LD X0	34ns	9.5ns	
	MOV D0 D1	102ns	19ns	
Constant scan		0.5 to 2000 ms (Setting available in 0.5 ms unit) (Setting by parameters)		
Program size		252K steps (1,008K bytes)	260K steps (1,040K bytes)	
Memory size	Program memory	1,008K bytes	1,040K bytes	
	Memory card (RAM)	Size of the installed memory card (2M bytes max.)	Size of the installed memory card (8M bytes max.)	
	Memory card (ROM)	Size of the installed memory card (Flash card: 4M bytes max., ATA card: 32M bytes max.)		
	Standard RAM	256K bytes	1,280K bytes	
	Standard ROM	1,008K bytes	4,096K bytes	
	CPU shared memory	8K bytes	QCPU standard memory: 8K bytes Multiple CPU high speed transmission area: 32K bytes	
Max. number of files stored	Program memory	252		
	Memory card (RAM)	287 (when Q2MEM-2MBS is used)	319 (when Q3MEM-8MBS is used)	
	Memory card (ROM)	Flash card	288	
		ATA card	512	511
	Standard RAM	3	4	
	Standard ROM	252	256	
Max. number of intelligent function module parameters	Initial setting	512	4096	
	Refresh	256	2048	
No. of times of writing data into program memory		–	Max. 100,000 times	
No. of times of writing data into the standard ROM		Max. 100,000 times		
No. of I/O device points		8192 points		
No. of I/O points		4096 points		
No. of device points	Internal relay [M]	8192 points by default (changeable)		
	Latch relay [L]	8192 points by default (changeable)		
	Link relay [B]	8192 points by default (changeable)		
	Timer [T]	2048 points by default (changeable)		
	Retentive timer [ST]	0 points by default (changeable)		
	Counter [C]	1024 points by default (changeable)		
	Data register [D]	12288 points by default (changeable)		
	Extended data register [D]	–	0 points by default (changeable)	
	Link register [W]	8192 points by default (changeable)		
	Extended link register [W]	–	0 points by default (changeable)	
	Annunciator [F]	2048 points by default (changeable)		
	Edge relay [V]	2048 points by default (changeable)		
	Link special relay [SB]	2048 points	2048 points (changeable)	
	Link special register [SW]	2048 points	2048 points (changeable)	
	Step relay [S]	8192 points		
	Index register [Z]	16 points	Max. 20 points	
	Index register [Z] (32-bits modification specification of ZR device)	–	Max. 10 points	

Item			Current model	Recommended model	
			Q25HCPU	Q26UDHCPU	
No. of device points	File register	[R]	Standard RAM	Up to 131072 points can be used by block switching in units of 32768 points.	Up to 655360 points can be used by block switching in units of 32768 points.
			SRAM card (1M bytes)	Up to 517120 points can be used by block switching in units of 32768 points.	
			SRAM card (2M bytes)	Up to 1041408 points can be used by block switching in units of 32768 points.	
			SRAM card (4M bytes)	–	Up to 2087936 points can be used by block switching in units of 32768 points.
			SRAM card (8M bytes)	–	Up to 4184064 points can be used by block switching in units of 32768 points.
			Flash card (2M bytes)	Up to 1041408 points can be used by block switching in units of 32768 points.	
			Flash card (4M bytes)	Up to 1042432 points can be used by block switching in units of 32768 points.	Up to 2087936 points can be used by block switching in units of 32768 points.
		[ZR]	Standard RAM	131072 points: Block switching not required.	655360 points: Block switching not required.
			SRAM card (1M bytes)	517120 points: Block switching not required.	
			SRAM card (2M bytes)	1041408 points: Block switching not required.	
			SRAM card (4M bytes)	–	2087936 points: Block switching not required.
			SRAM card (8M bytes)	–	4184064 points: Block switching not required.
			Flash card (2M bytes)	1041408 points: Block switching not required.	
			Flash card (4M bytes)	1042432 points: Block switching not required.	2087936 points: Block switching not required.
	Pointer [P]			4096 points	
	Interrupt pointer [I]			256 points	
	Special relay [SM]			2048 points	
	Special register [SD]			2048 points	
	Function input [FX]			16 points	
	Function output [FY]			16 points	
	Function register [FD]			5 points	
Latch (power failure latch) range			L0 to 8191 (default) Latch range can be set for B, F, V, T, ST, C, D, and W. (Setting by parameters)		
RUN/PAUSE contact			One contact each can be set from X0 to 1FFF for RUN and PAUSE. (Setting by parameters)		
Clock function			Year, month, date, hour, minute, second, and day of the week (automatic leap year detection) Accuracy: -3.18 to +5.25s (TYP.+2.12s)/d at 0°C Accuracy: -3.93 to +5.25s (TYP.+1.90s)/d at 25°C Accuracy: -14.69 to +3.53s (TYP.-3.67s)/d at 55°C	Year, month, date, hour, minute, second, and day of the week (automatic leap year detection) Accuracy: -2.96 to +3.74s (TYP.+1.42s)/d at 0°C Accuracy: -3.18 to +3.74s (TYP.+1.50s)/d at 25°C Accuracy: -13.20 to +2.12s (TYP.-3.54s)/d at 55°C	
5 VDC internal current consumption			0.64A	0.39A	

Revision Record

Issued	Manual number	Revision
June 2011	L(NA)08222ENG-A	First Edition

Country/Region	Sales office	Tel/Fax
USA	Mitsubishi Electric Automation Inc. 500 Corporate Woods Parkway Vernon Hills, IL 60061, USA	Tel : +1-847-478-2100 Fax : +1-847-478-2253
Brazil	MELCO-TEC Rep. Com.e Assessoria Tecnica Ltda. Av Paulista, 1439-Cj. 72 Cerqueira Cesar CEP 01311-200, Sao Paulo, SP, CEP:01311-200, Brazil	Tel : +55-11-3146-2200 Fax : +55-11-3146-2217
Germany	Mitsubishi Electric Europe B.V. German Branch Gothaer Strasse 8 D-40880 Ratingen, Germany	Tel : +49-2102-486-0 Fax : +49-2102-486-1120
UK	Mitsubishi Electric Europe B.V. UK Branch Travellers Lane, Hatfield, Hertfordshire., AL10 8XB, UK	Tel : +44-1707-276100 Fax : +44-1707-278695
Italy	Mitsubishi Electric Europe B.V. Italian Branch Viale Colleoni 7-20041 Agrate Brianza (Milano), Italy	Tel : +39-039-60531 Fax : +39-039-6053312
Spain	Mitsubishi Electric Europe B.V. Spanish Branch Carretera de Rubi 76-80 E-08190 Sant Cugat del Valles(Barcelona), Spain	Tel : +34-93-565-3131 Fax : +34-93-589-2948
France	Mitsubishi Electric Europe B.V. French Branch 25,Boulevard des Bouvets, F-92741 Nanterre Cedex, France	Tel : +33-1-5568-5568 Fax : +33-1-5568-5757
Czech Republic	Mitsubishi Electric Europe B.V.-o.s.-Czech office Avenir Business Park, Radlická 714/113a CZ-158 00 Praha 5	Tel : +420-251-551-470 Fax : +420-251-551-471
Poland	Mitsubishi Electric Europe B.V. Polish Branch ul. Krakowska 50 32-083 Balice, Poland	Tel : +48-12-630-47-00 Fax : +48-12-630-47-01
Russia	Mitsubishi Electric Europe B.V. Russian branch St.Petersburg office Sverdlovskaya emb., bld "Sch", BC "Benua", office 720; 195027, St.Petersburg, Russia	Tel : +7-812-633-3497 Fax : +7-812-633-3499
South Africa	Circuit Breaker Industries Ltd. 9 Derrick Road, Spartan, Gauteng PO Box 100, Kempton Park 1620, South Africa	Tel : +27-11-977-0770 Fax : +27-11-977-0761
China	Mitsubishi Electric Automaiton (China) Ltd. No.1386 Hongqiao Road,Mitsubishi Electric Automation Center Shanghai China	Tel : +86-21-2322-3030 Fax : +86-21-2322-3000
Taiwan	Setsuyo Enterprise Co., Ltd. 6F., No.105, Wugong 3 rd, Wugu Dist, New Taipei City 24889, Taiwan, R.O.C.	Tel : +886-2-2299-2499 Fax : +886-2-2299-2509
Korea	Mitsubishi Electric Automation Korea Co., Ltd. 1480-6, Gayang-dong, Gangseo-ku Seoul 157-200, Korea	Tel : +82-2-3660-9530 Fax : +82-2-3664-8372
Singapore	Mitsubishi Electric Asia Pte, Ltd. 307 Alexandra Road #05-01/02, Mitsubishi Electric Bulding Singapore 159943	Tel : +65-6470-2480 Fax : +65-6476-7439
Thailand	Mitsubishi Electric Automation (Thailand) Co., Ltd. Bang-Chan Industrial Estate No.111 Soi Serithai 54, T.Kannayao, A.Kannayao, Bangkok 10230 Thailand	Tel : +66-2-906-3238 Fax : +66-2-906-3239
Indonesia	P.T. Autoteknindo Sumber Makmur Muara Karang Selatan Block A/Utara No.1 Kav. No.11 Kawasan Industri/Pergudangan Jakarta-Utara 14440, P.O Box5045 Jakarta 11050, Indonesia	Tel : +62-21-663-0833 Fax : +62-21-663-0832
India	Mitsubishi Electric India Pvt. Ltd. 2nd Floor, DLF Building No.9B, DLF Cyber City Phase III, Gurgaon 122002, Haryana, India	Tel : +91-124-4630300 Fax : +91-124-4630399
Australia	Mitsubishi Electric Australia Pty.Ltd. 348 Victoria Road, Rydalmere, N.S.W 2116, Australia	Tel : +61-2-9684-7777 Fax : +61-2-9684-7245

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE: TOKYO BUILDING, 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN
NAGOYA WORKS: 1-14, YADA-MINAMI 5, HIGASHI-KU, NAGOYA, JAPAN