

Upgrading existing programmable controller systems using the time and wire saving devices

Modules that have no applicable module in the programmable controller series after replacement or modules that do not support the use of a conversion adapter can be replaced using the time and wire saving devices. With the use of these devices, the wiring work time can be reduced significantly.

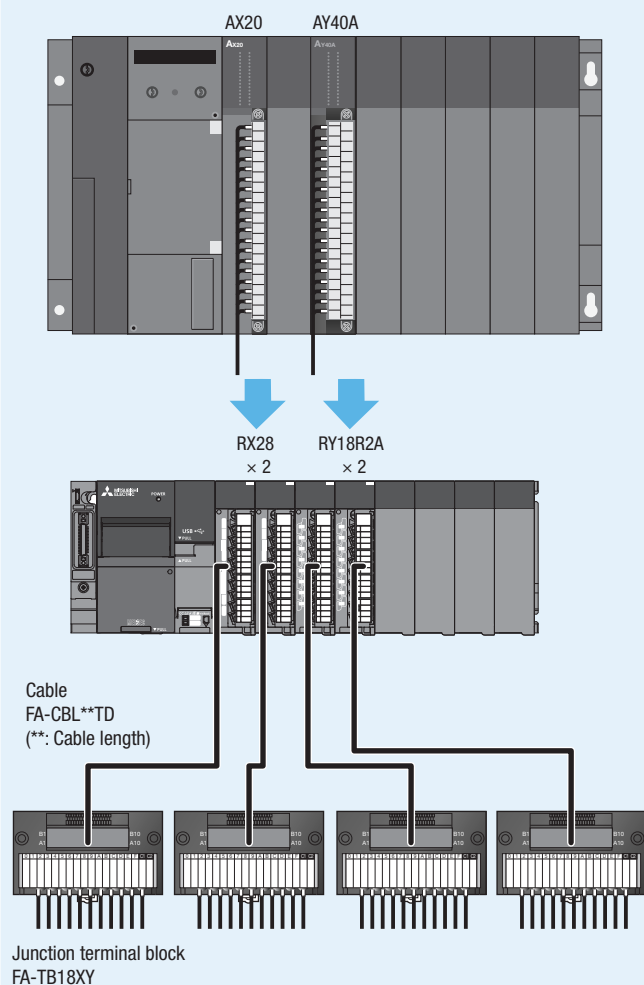
Replacing the MELSEC-A series with the MELSEC iQ-R series

▶ Suggestion [1]

Use of junction terminal blocks

◎ Replacement example using junction terminal blocks

Example) AX20 → RX28 × 2, AY40A → RY18R2A × 2



Reference

Replacement method → P.75

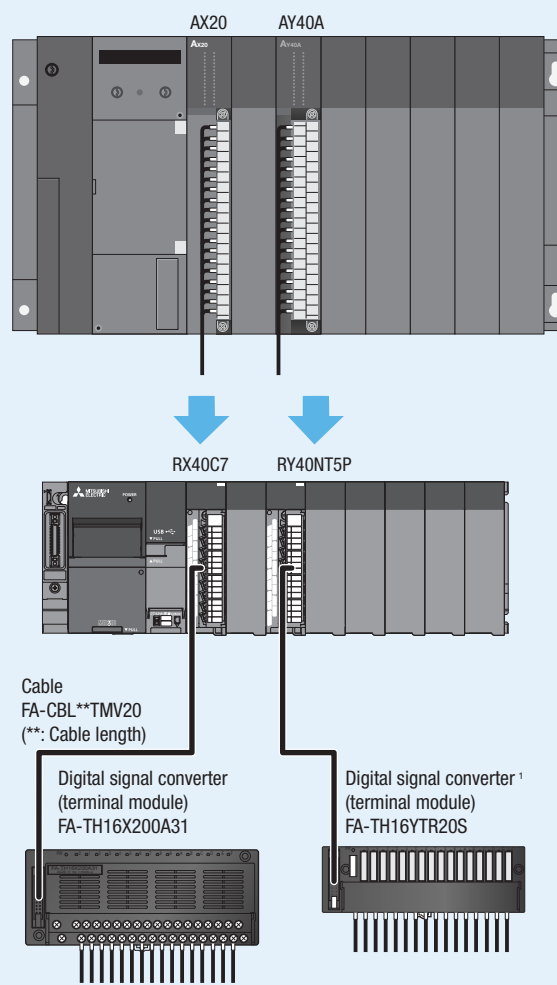
Modules to be replaced → P.78 and P.79

▶ Suggestion [2]

Use of digital signal converters (terminal modules)

◎ Replacement example using digital signal converters (terminal modules)

Example) AX20 → RX40C7 × 1, AY40A → RY40NT5P × 1



Reference

Replacement method → P.76

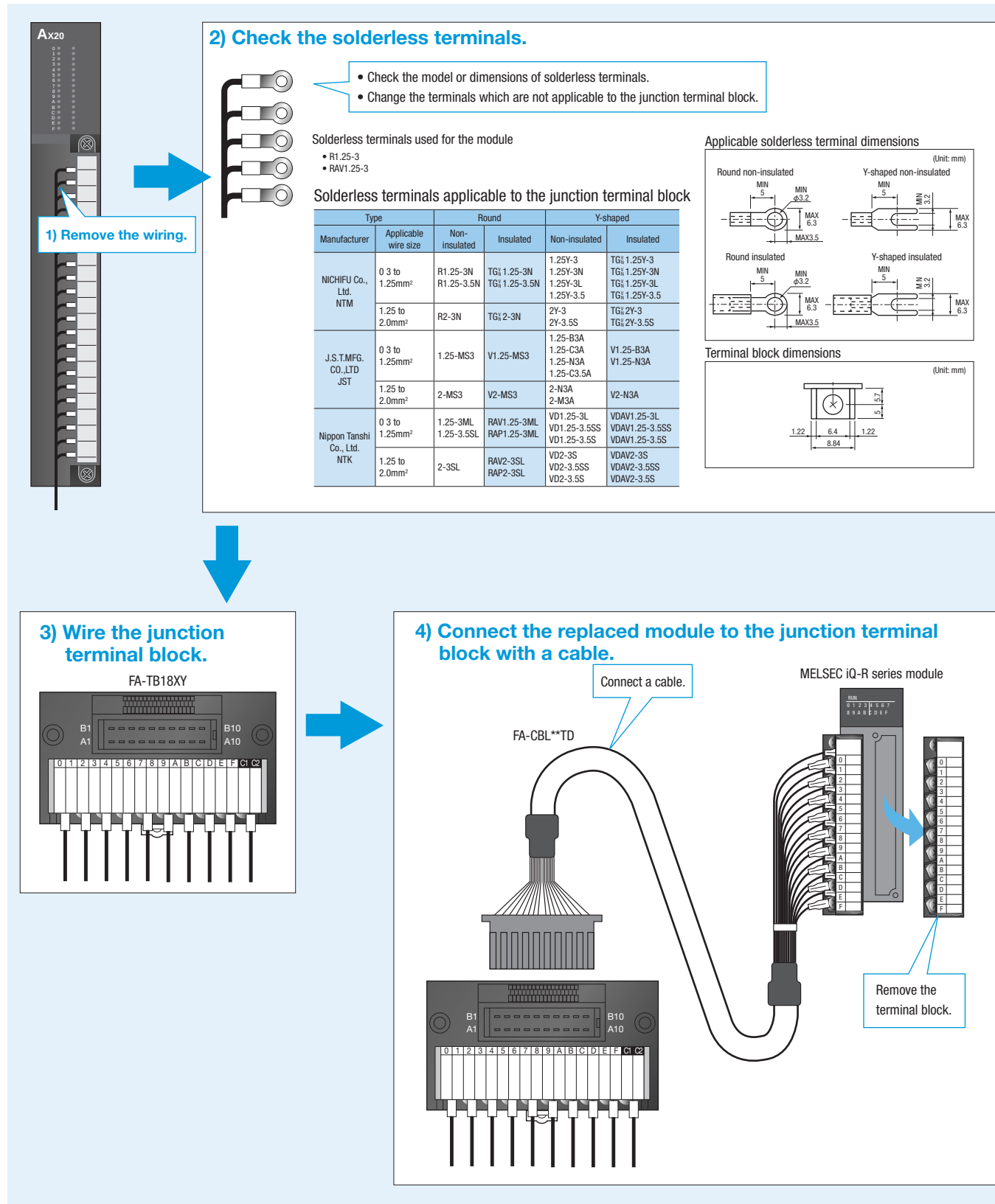
Input modules to be replaced → P.78 and P.79

Output modules to be replaced → P.78 and P.79

*1: The spring clamp terminal block type output terminal module, FA1-TH16Y1TR20S1E, can be used by changing the solderless terminals (round and Y-shaped) to the ferrules.

Junction terminal block

The following is an example when a MELSEC-A series input module (16-point, 200VAC) is replaced using a junction terminal block.



Note

- For the specifications of the junction terminal block, refer to our website or the FAgoods General Catalog: Time and Wire Saving Devices.
- Check that the junction terminal block used satisfies the system specifications prior to use.

Digital signal converter (terminal module)

The following is an example when a MELSEC-A series input module (16-point, 200VAC) is replaced using a digital signal converter (terminal module).



1) Remove the wiring.

2) Check the solderless terminals.

- Check the model or dimensions of solderless terminals.
- Change the terminals which are not applicable to the digital signal converter (terminal module). Especially, the solderless terminals need to be changed when the AX50, AX50-S1, AX60, and AX60-S1 are replaced. (This is because the screw size of the digital signal converter (terminal module) is M3.5.)

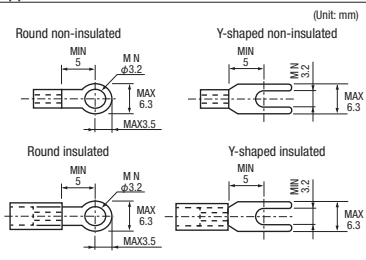
Solderless terminals used for the module

- R1.25-3
- RAV1.25-3

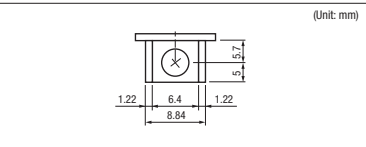
Solderless terminals applicable to the digital signal converter (terminal module) (M3 screw, 7.62mm pitch)

Type	Applicable wire size	Round		Y-shaped	
		Non-insulated	Insulated	Non-insulated	Insulated
NICHIFU Co., Ltd. NTK	0.3 to 1.25mm ²	R1.25-3N R1.25-3.5N	TG ₁ 1.25-3N TG ₁ 1.25-3.5N	1.25Y-3 1.25Y-3N 1.25Y-3L 1.25Y-3.5	TG ₁ 1.25Y-3 TG ₁ 1.25Y-3N TG ₁ 1.25Y-3L TG ₁ 1.25Y-3.5
	1.25 to 2.0mm ²	R2-3N	TG ₁ 2-3N	2Y-3 2Y-3.5S	TG ₁ 2Y-3 TG ₁ 2Y-3.5S
J.S.T.MFG. CO., LTD. JST	0.3 to 1.25mm ²	1.25-MS3	V1.25-MS3	1.25-B3A 1.25-C3A 1.25-N3A 1.25-C3.5A	V1.25-B3A V1.25-N3A
	1.25 to 2.0mm ²	2-MS3	V2-MS3	2-N3A 2-M3A	V2-N3A
Nippon Tanshi Co., Ltd. NTK	0.3 to 1.25mm ²	1.25-3ML 1.25-3.SSL	RAV1.25-3ML RAP1.25-3ML	VD1.25-3L VD1.25-3.SSS VD1.25-3.SS	VDAV1.25-3L VDAV1.25-3.SSS VDAV1.25-3.SS
	1.25 to 2.0mm ²	2-3SL	RAV2-3SL RAP2-3SL	VD2-3S VD2-3.5SS VD2-3.SS	VDAV2-3S VDAV2-3.5SS VDAV2-3.SS

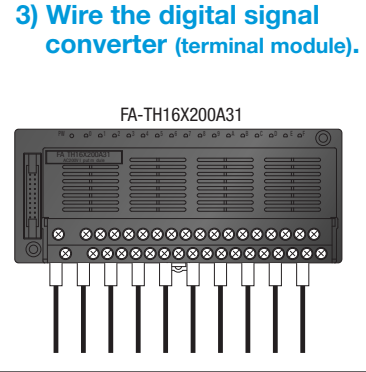
Applicable solderless terminal dimensions



Terminal block dimensions



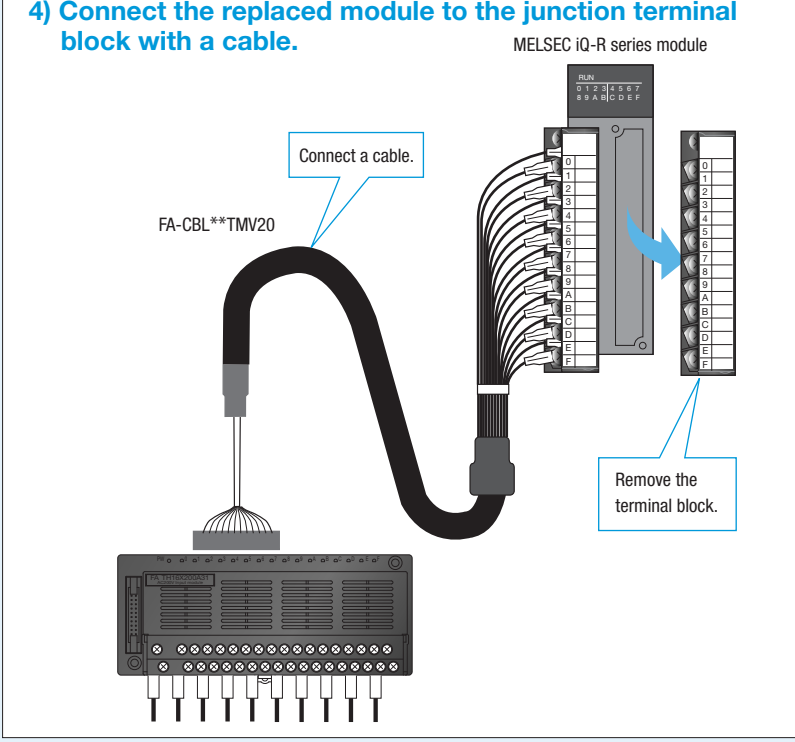




3) Wire the digital signal converter (terminal module).

4) Connect the replaced module to the junction terminal block with a cable.

MELSEC iQ-R series module



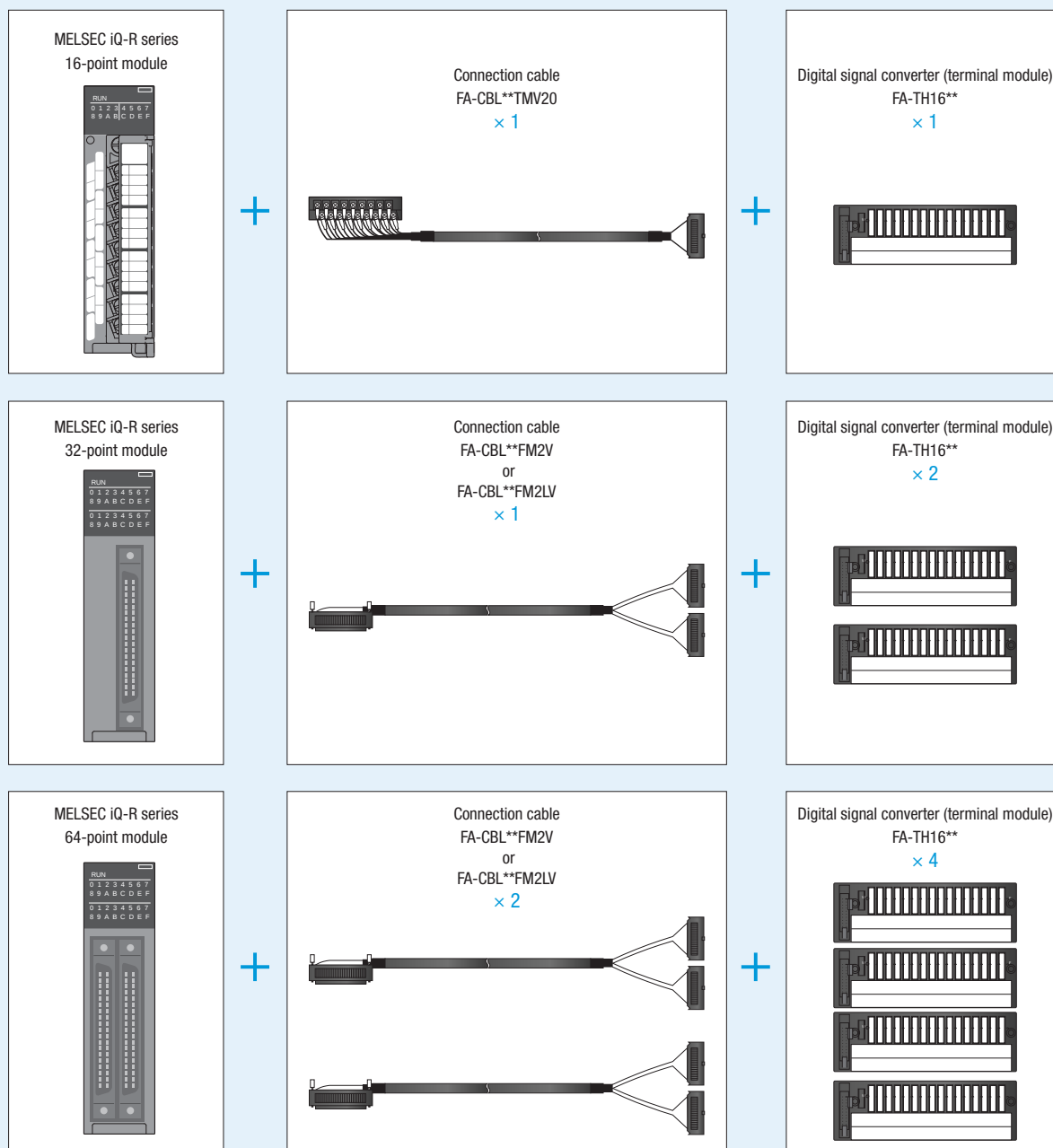
Note

- For the specifications of the digital signal converter, refer to our website or the FAgoods General Catalog: Time and Wire Saving Devices.
- Check that the digital signal converter (terminal module) used satisfies the system specifications prior to use.

Number of cables and modules

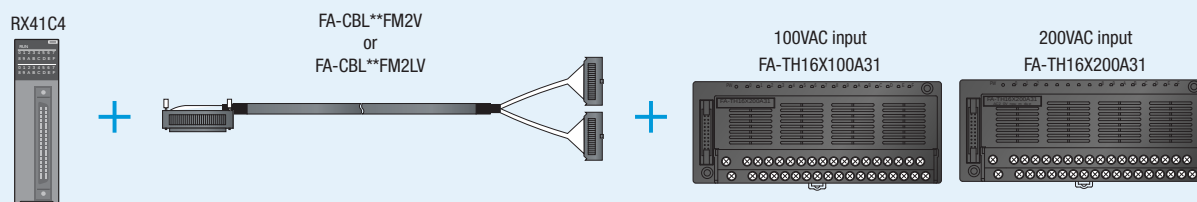
The digital signal converter (terminal module) has 16 input/output points. Therefore, the number of cables and modules differs depending on the number of points of I/O module after replacement.

The number of cables and modules of the 16-point, 32-point, and 64-point I/O modules will be as follows.



Advantage of using a digital signal converter (terminal module)

- A digital signal converter (terminal module) has 16 input/output points and can be isolated from the programmable controller at every 16 points. Therefore, different digital signal converters (terminal modules) can be used for each 16-point group.

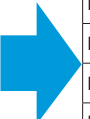


Modules to be replaced using a junction terminal block

MELSEC-A series module						Replacement using time and wire saving devices				
						MELSEC iQ-R series module				
	Model	Specifications	No. of points	Terminal		Model	Specifications	No. of points	No. of required modules	
Input	AX20	200VAC, 16 points/common	16	20P		RX28	100 to 240VAC, 8 points/common	8	2	
	AX21	200VAC, 32 points/common	32	38P				4		
Output	AY40A	Transistor output, 12/24VDC, 0.3A, independent common, sink type	16	38P		RY18R2A	Contact output, 240VAC/24VDC, 2A, independent common	8	2	
	AY60	Transistor output, 24/(12/48)VDC, 2A, 8 points/ common, sink type, with fuse		20P		RY10R2	Contact output, 240VAC/24VDC, 2A, 16 points/common	16	1	
	AY60E	Transistor output, 24/(12)VDC, 2A, 48VDC, 0.8A, 8 points/common, source type, with fuse								
	AY60S	Transistor output, 24/48/(12)VDC, 2A, 8 points/ common, sink type, with fuse								

Note) For the detailed specifications of each module, refer to the user's manual for each module used, our website, or the FAgoods General Catalog: Time and Wire Saving Devices.

Input modules to be replaced using a digital signal converter (terminal module)

MELSEC-A series input module						Replacement using time and wire saving devices							
Input type	Model	Specifications	No. of points	No. of modules		MELSEC iQ-R series module			Digital signal converter (terminal module)				
						Model	No. of points	No. of required modules	Cable model	No. of required cables	Module model	No. of required modules	
200VAC input	AX20	200 to 240VAC input, 16 points/common, input current 10mA	16	1		RX40C7	16	1	FA-CBL**TMV20	1	FA-TH16X200A31	1	
				2		RX41C4	32		FA-CBL**FM2V	1		2	
				4		RX42C4	64		2	4			
	AX21	200 to 240VAC input, 32 points/common, input current 10mA	32	1		RX41C4	32	1	FA-CBL**FM2V	1	FA-TH16X200A31	2	
				2		RX42C4	64		2	4			
48VDC input	AX50	48VDC input, 8 points/common, sink type, input current 4mA	16	1	RX40C7	16	1	FA-CBL**TMV20	1	FA-TH16X48D31L	1		
	AX50-S1	48VDC input, 8 points/common, sink/ source type, input current 4mA		2	RX41C4	32		FA-CBL**FM2V	1		2		
				4	RX42C4	64		2	4				
100VDC input	AX60	100/110/125VDC input, 8 points/common, sink type, input current 2mA	16	1	RX40C7	16	1	FA-CBL**TMV20	1	FA-TH16X100D31L	1		
	AX60-S1	100/110/125VDC input, 8 points/common, sink/source type, input current 2mA		2	RX41C4	32		FA-CBL**FM2V	1		2		
				4	RX42C4	64		2	4				

Output modules to be replaced using a digital signal converter (terminal module)

MELSEC-A series input module						Replacement using time and wire saving devices							
Output type	Model	Specifications	No. of points	No. of modules		MELSEC iQ-R series module			Digital signal converter (terminal module)				
						Model	No. of points	No. of required modules	Cable model	No. of required cables	Module model	No. of required modules	
Transistor output	AY40A	12/24VDC, 0.3A, independent common, sink type	16	1		RY40NT5P	16	1	FA-CBL**TMV20	1	FA-TH16YTR20S ^{*1}	1	
				RY41NT2P		32	FA-CBL**FM2V		1	2			
				RY42NT2P		64			2	4			

*1: The spring clamp terminal block type output terminal module, FA1-TH16Y1TR20S1E, can be used by changing the solderless terminals (round and Y-shaped) to the ferrules.

** indicates a cable length.

Replacement using time and wire saving devices								
	Junction terminal block							
	Cable model	No. of required cables	Module model	No. of required modules	Specifications	No. of points	Terminal	Remarks
	FA-CBL **TD	2	FA-TB18XY	2	18 points terminal conversion (8 points conversion, 1-wire type)	8	18P	• Two MELSEC iQ-R modules are required.
		4		4				• Four MELSEC iQ-R modules are required.
	FA-CBL **TD	2	FA-TB18XY	2	18 points terminal conversion (8 points conversion, independent common)	8	18P	• Two MELSEC iQ-R modules are required.
		1	FA-TB161AC	1	18 points terminal conversion (16 points conversion, 1-wire type)	16		• The output type changes from transistor output to contact output. • MELSEC iQ-R modules do not have a fuse.
			FA-TB161ACC2		34 points terminal conversion (16 points conversion, 2-wire type)			
			FA-TB161AC		18 points terminal conversion (16 points conversion, 1-wire type)			
			FA-TB161ACC2		34 points terminal conversion (16 points conversion, 2-wire type)			
			FA-TB161AC		18 points terminal conversion (16 points conversion, 1-wire type)			
			FA-TB161ACC2		34 points terminal conversion (16 points conversion, 2-wire type)			

** indicates a cable length.

Replacement using time and wire saving devices			
Digital signal converter (terminal module)			
	Specifications	Wiring precautions	Remarks
	200 to 220VAC input, 16 points/common, input current approx. 7.5mA	-	• The input voltage changes from 200 to 240VAC to 200 to 220VAC. • The input current drops from 10mA to 7.5mA. • To use a digital signal converter, an external power supply (24VDC) is required.
	48VDC input, 16 points/common, sink/source type, input current approx. 5mA	• 8 points/common can no longer be used after replacement. • The terminal block uses M3.5 screws.	• The input current drops from 4mA to 5mA. • To use a digital signal converter, an external power supply (24VDC) is required.
	100/110VDC input, 16 points/common, input current 2.5mA	• 8 points/common can no longer be used after replacement. • The terminal block uses M3.5 screws.	• The input voltage changes from 100/110/125VDC to 100/110VDC. • The input current drops from 2mA to 2.5mA. • To use a digital signal converter, an external power supply (24VDC) is required.

** indicates a cable length.

Replacement using time and wire saving devices		
Digital signal converter (terminal module)		
	Specifications	Remarks
	3 to 30VDC, 1A, independent common (socket type, transistor replaceable)	• To use a digital signal converter, an external power supply (24VDC) is required.