

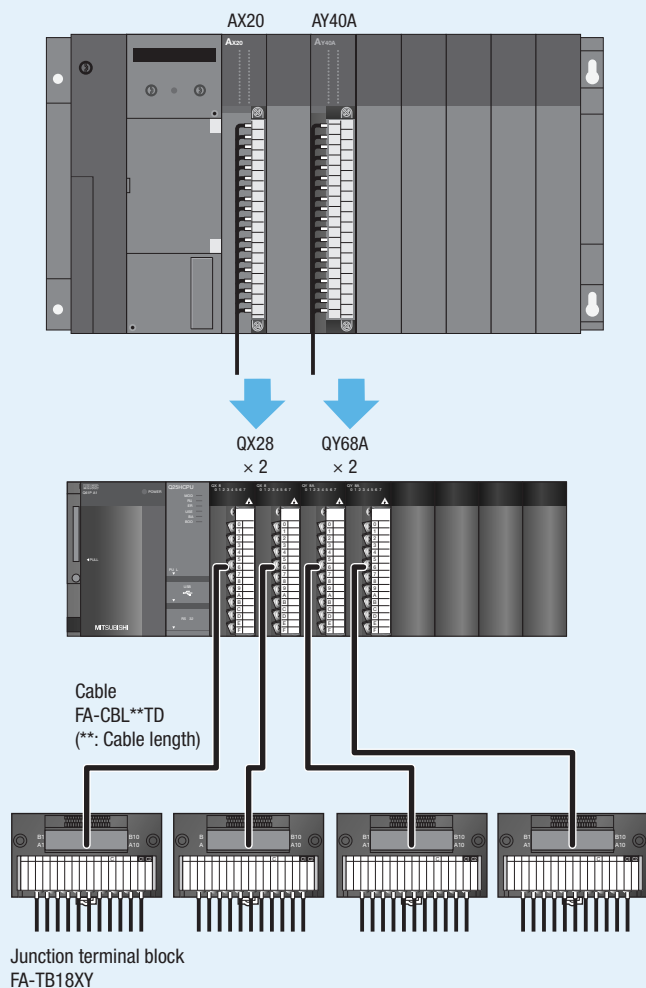
Replacing the MELSEC-A series with the MELSEC-Q series

Suggestion [1]

Use of junction terminal blocks

◎ Replacement example using junction terminal blocks

Example) AX20 → QX28 × 2, AY40A → QY68A × 2



Reference

Replacement method → P.81

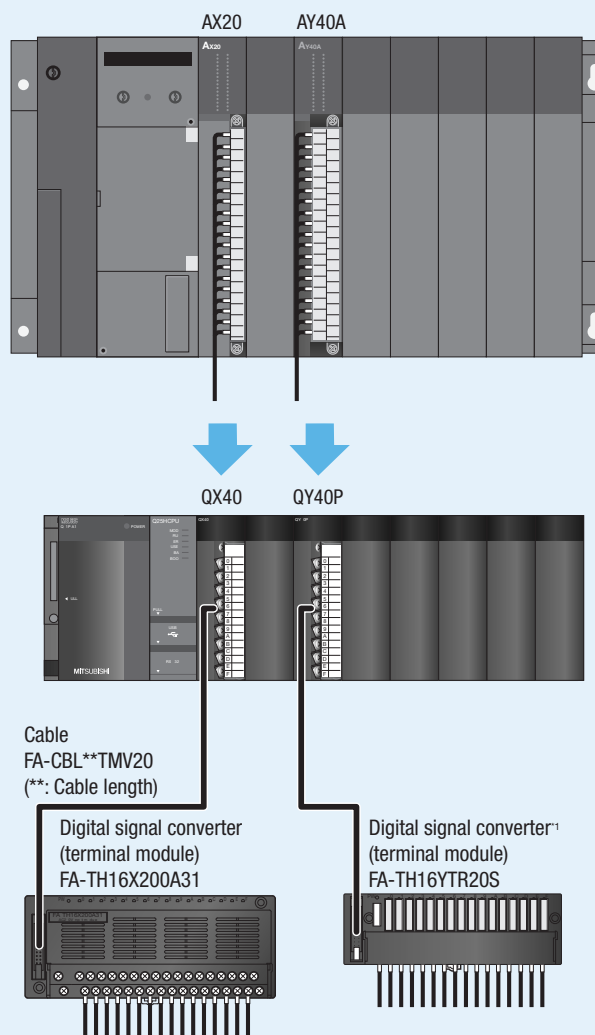
Modules to be replaced → P.84 and P.85

Suggestion [2]

Use of digital signal converters (terminal modules)

◎ Replacement example using digital signal converters (terminal modules)

Example) AX20 → QX40 × 1, AY40A → QY40P × 1



Reference

Replacement method → P.82

Input modules to be replaced → P.84 and P.85

Output modules to be replaced → P.84 and P.85

*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.



2) Check the solderless terminals.

- Check the model or dimensions of solderless terminals.
- Change the terminals which are not applicable to the junction terminal block.

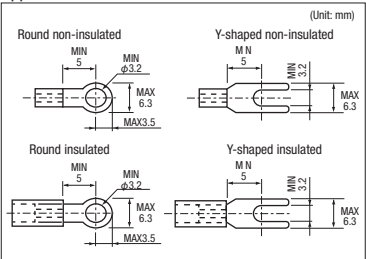
Solderless terminals used for the module

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

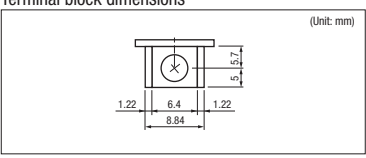
Solderless terminals applicable to the junction terminal block

Manufacturer	Type	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 ₂ 2-3N	2Y-3 2Y-3.5S	TG ₂ 2Y-3 TG ₂ 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 1.25-3.5SL	RAV1.25-3ML RAP1.25-3ML	VD1.25-3L VD1.25-3.5SS VD1.25-3.5S	VDAV1.25-3L VDAV1.25-3.5SS VDAV1.25-3.5S
	1.25 to 2.0mm ²	2-3SL	RAV2-3SL RAP2-3SL	VD2-3S VD2-3.5SS VD2-3.5S	VDAV2-3S VDAV2-3.5SS VDAV2-3.5S

Applicable solderless terminal dimensions (Unit: mm)



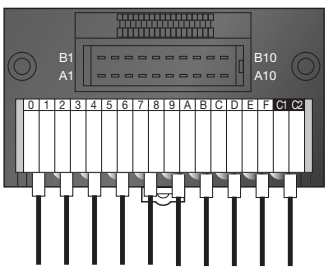
Terminal block dimensions (Unit: mm)

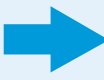




3) Wire the junction terminal block.

FA-TB18XY





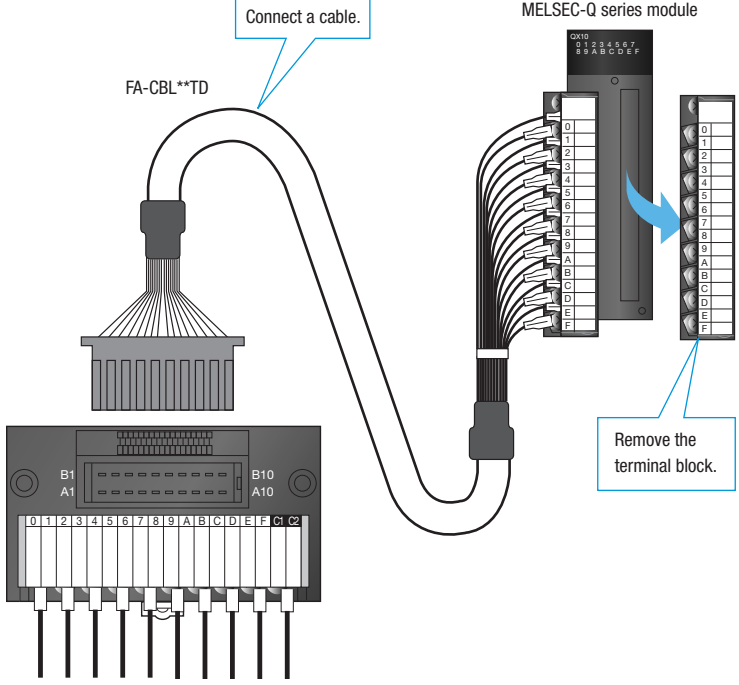
4) Connect the replaced module to the junction terminal block with a cable.

Connect a cable.

FA-CBL**TD

MELSEC-Q series module

Remove the 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.)

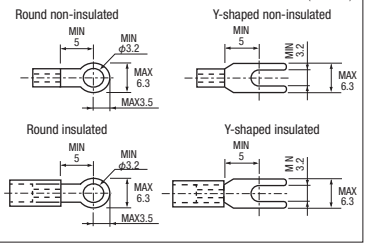
Solderless terminals used for the module

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

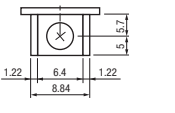
Solderless terminals applicable to the digital signal converter (terminal module) (M3 screw, 7.62mm pitch)

Manufacturer	Type	Round		Y-shaped	
		Applicable wire size	Non-insulated	Insulated	Non-insulated
NICHIFU Co., Ltd. NTM	0.3 to 1.25mm ²	R1.25-3N R1.25-3.5N	TG $\frac{1}{2}$ 1.25-3N TG $\frac{1}{2}$ 1.25-3.5N	1.25Y-3 1.25Y-3N 1.25Y-3L 1.25Y-3.5	TG $\frac{1}{2}$ 1.25Y-3 TG $\frac{1}{2}$ 1.25Y-3N TG $\frac{1}{2}$ 1.25Y-3L TG $\frac{1}{2}$ 1.25Y-3.5
	1.25 to 2.0mm ²	R2-3N	TG $\frac{1}{2}$ 2-3N	2Y-3 2Y-3.5S	TG $\frac{1}{2}$ 2Y-3 TG $\frac{1}{2}$ 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 VD1.25-3.5SS VD1.25-3.5S	VDAV1.25-3L VDAV1.25-3.5SS VDAV1.25-3.5S
	1.25 to 2.0mm ²	2-3SL	RAV2-3SL RAP2-3SL	VD2-3S VD2-3.5SS VD2-3.5S	VDAV2-3S VDAV2-3.5SS VDAV2-3.5S

Applicable solderless terminal dimensions (Unit: mm)

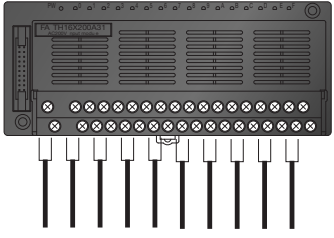


Terminal block dimensions (Unit: mm)



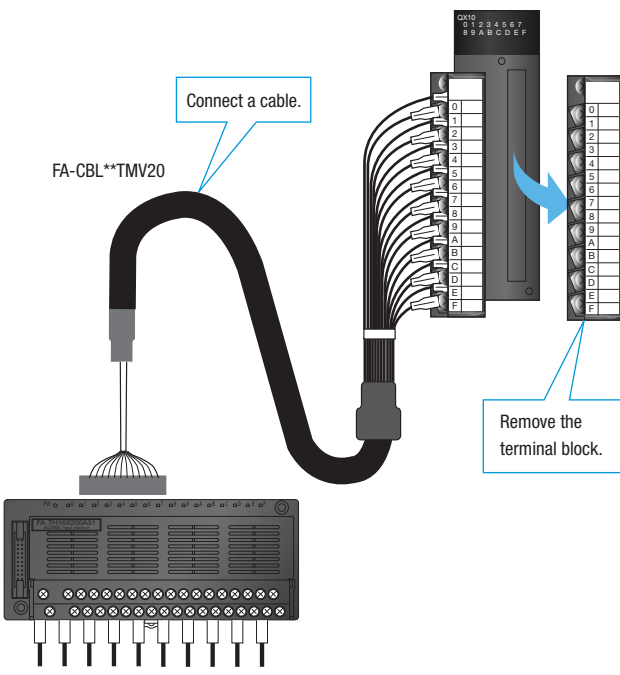


3) Wire the digital signal converter (terminal module).



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

MELSEC-Q series module



Note

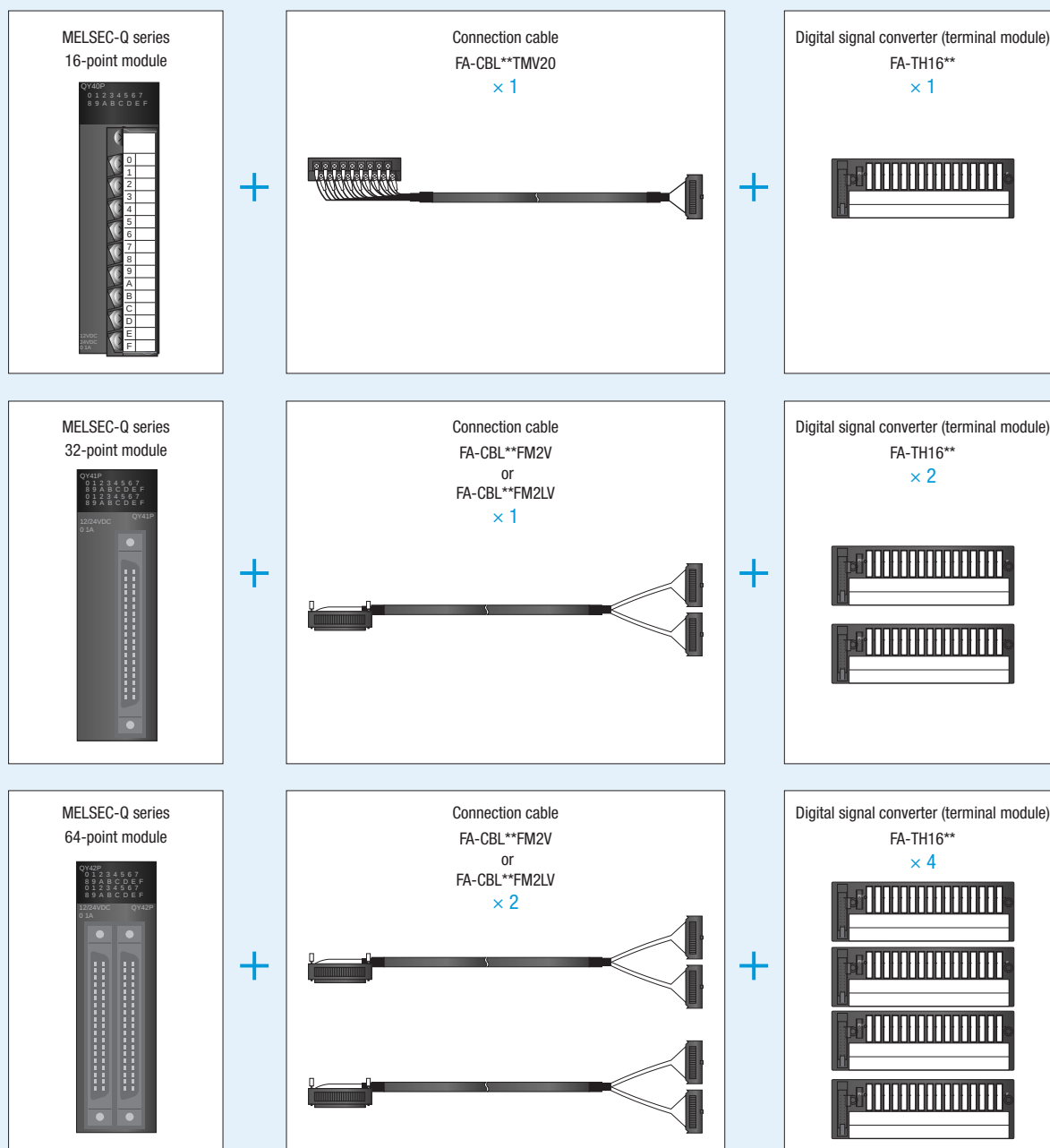
- For the specifications of the digital signal converter, refer to our website or the Fagoods General Catalog: Time and Wire Saving Devices.
- Check that the digital signal converter (terminal module) used satisfies the system specifications prior to use.

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Number of cables and modules

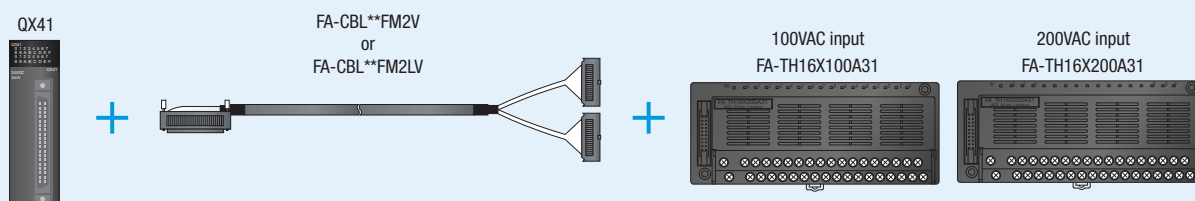
The digital signal converter (terminal module) has 16 input/output points. Therefore, the number of cables and modules differs depending on the number of points of I/O module after replacement.

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.

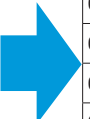


Modules to be replaced using a junction terminal block

MELSEC-A series module						Replacement using time and wire saving devices				
						MELSEC-Q 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		QX28	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		QY68A	Transistor output, 5 to 24VDC, 2A, independent common, sink/source shared type	8	2	
	AY60	Transistor output, 24/(12/48)VDC, 2A, 8 points/ common, sink type, with fuse								
	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-Q 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		QX40	16	1	FA-CBL**TMV20	1	FA-TH16X200A31	1		
				2		QX41	32		1	FA-CBL**FM2V		1		2
				4		QX42	64		2	4				
	AX21	200 to 240VAC input, 32 points/common, input current 10mA	32	1		QX41	32	1	FA-CBL**FM2V	1	FA-TH16X200A31	2		
				2		QX42	64		2	4				
100VDC input	AX60	100/110/125VDC input, 8 points/common, sink type, input current 2mA	16	1	QX40	16	1	FA-CBL**TMV20	1	FA-TH16X100D31L	1			
				2	QX41	32		1	FA-CBL**FM2V		1		2	
				4	QX42	64		2	4					
	AX60-S1	100/110/125VDC input, 8 points/common, sink/source type, input current 2mA		1	QX40	16	1	FA-CBL**TMV20	1	FA-TH16X100D31L	1			
				2	QX41	32		1	FA-CBL**FM2V	1	2			
				4	QX42	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-Q 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	→	QY40P	16	1	FA-CBL**TMV20	1	FA-TH16YTR20S ^{*1}	1
				2		QY41P	32		FA-CBL**FM2V	1		2
				4		QY42P	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-Q modules are required. - Four MELSEC-Q modules are required.
		4		4				
	FA-CBL **TD	2	FA-TB18XY	2	18 points terminal conversion (8 points conversion, independent common)	8	18P	- Two MELSEC-Q modules are required. 48VDC is not supported.
								- Two MELSEC-Q modules are required. - A cable for wiring common terminals is required. - MELSEC iQ-R modules do not have a fuse. 48VDC is not supported.

** 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.
	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.