

mitsubishi

PROGRAMMABLE CONTROLLER

MELSEC-A

User's Manual

Transmission converter unit
type AJ35PTC(PP)-CNV-(SI/GI)

REVISIONS

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

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INTRODUCTION

Thank you for choosing the Mitsubishi MELSEC-A Series of General Purpose Programmable Controllers. Please read this manual carefully so that the equipment is used to its optimum. A copy of this manual should be forwarded to the end User.

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1. GENERAL DESCRIPTION

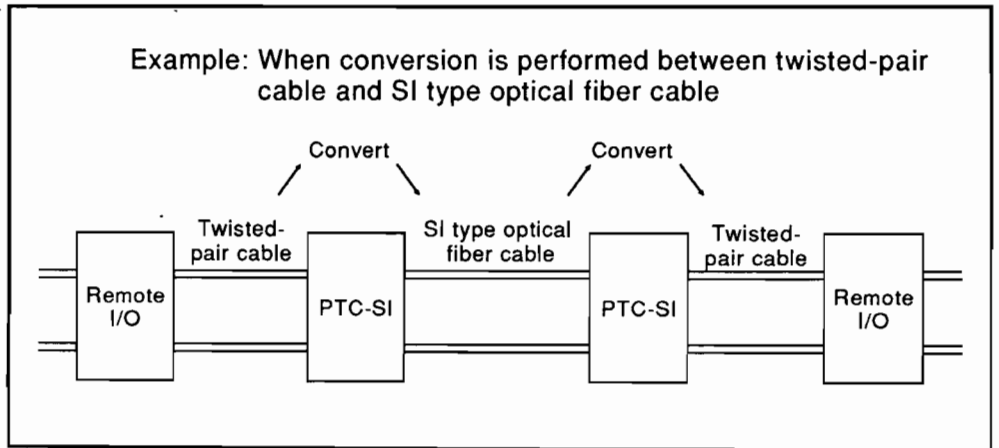
This manual gives information on specifications, handling, etc. for the AJ35PTC(PP)-CNV-SI/GI type Transmission Converter (referred to as "transmission converter") which is used by connecting to the MELSEC-NET/MINI-S3 Data Link System (referred to as "NET/MINI") and the A2CCPU System.

The transmission converter converts the transmission path of the NET/MINI and A2CCPU systems. Transmission converter enables long distance transmission to be performed and optical parts (optical rotary joint, etc.) to be connected. There are 6 types of transmission converters which enable the following conversion methods available.

- (1) AJ35PTC-CNV Twisted-pair cable ↔ Plastic fiber cable
- (2) AJ35PTC-CNV-SI Twisted-pair cable ↔ SI type optical fiber cable
- (3) AJ35PTC-CNV-GI Twisted-pair cable ↔ GI type optical fiber cable
- (4) AJ35PP-CNV Plastic fiber cable ↔ Plastic fiber cable
- (5) AJ35PP-CNV-SI Plastic fiber cable ↔ SI type optical fiber cable
- (6) AJ35PP-CNV-GI Plastic fiber cable ↔ GI type optical fiber cable

In this manual, the names of converters are abbreviated as follows:

- AJ35PTC-CNV → PTC-CNV
- AJ35PTC-CNV-SI → PTC-SI
- AJ35PTC-CNV-GI → PTC-GI
- AJ35PP-CNV → PP-CNV
- AJ35PP-CNV-SI → PP-SI
- AJ35PP-CNV-GI → PP-GI



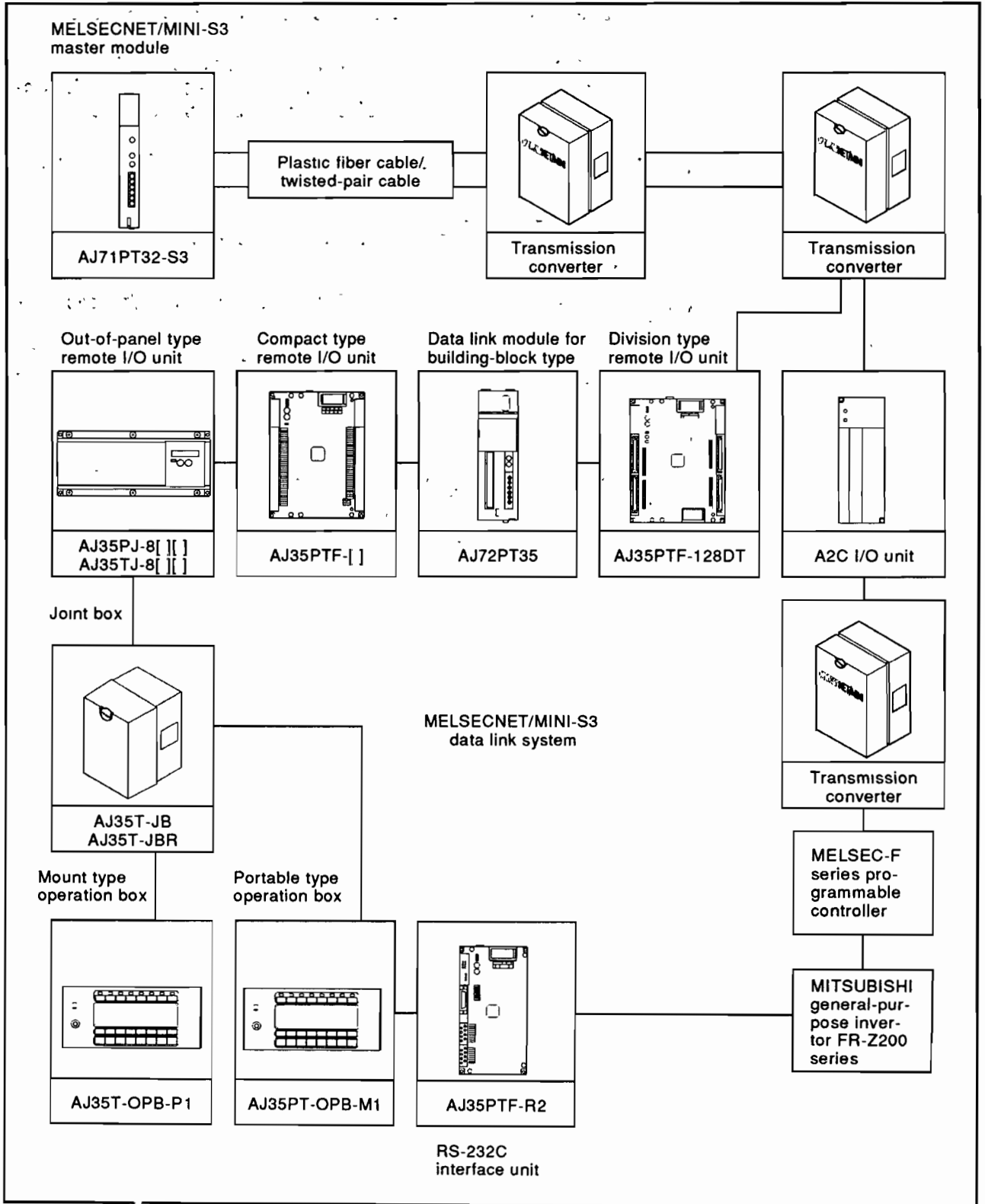
1.1 Features

- (1) Distance between stations extensible up to 1 or 2km(1094 or 2187yd)
 - The distance between stations can be extended up to 1km(1094yd) using two units of twisted-pair cable/plastic fiber cable SI type optical fiber cable transmission converters.
 - The distance between stations can be extended up to 2km(2187yd) using 2 units of twisted-pair cable/plastic fiber cable GI type optical fiber cable transmission converters.
- (2) Available as a relay box for extending the distance between stations
Since the transmission converter has no dedicated station, multiple converters are used in each loop of the NET/MINI to extend the distance.
- (3) Transmission cables of the unit for twisted-pair cable/plastic fiber cable
Unit for optical fiber cable can be used in the network of twisted-pair cable. Unit for twisted-pair cable can be used in the network of optical fiber cable.
- (4) Optical parts available
Conversion into the GI type optical fiber cable enables optical parts (optical rotary joint for GI type optical fiber cable, etc.) to be available.

2. SYSTEM CONFIGURATION

This chapter describes the system configurations of the transmission converters in both NET/MINI and A2CCPU systems in use.

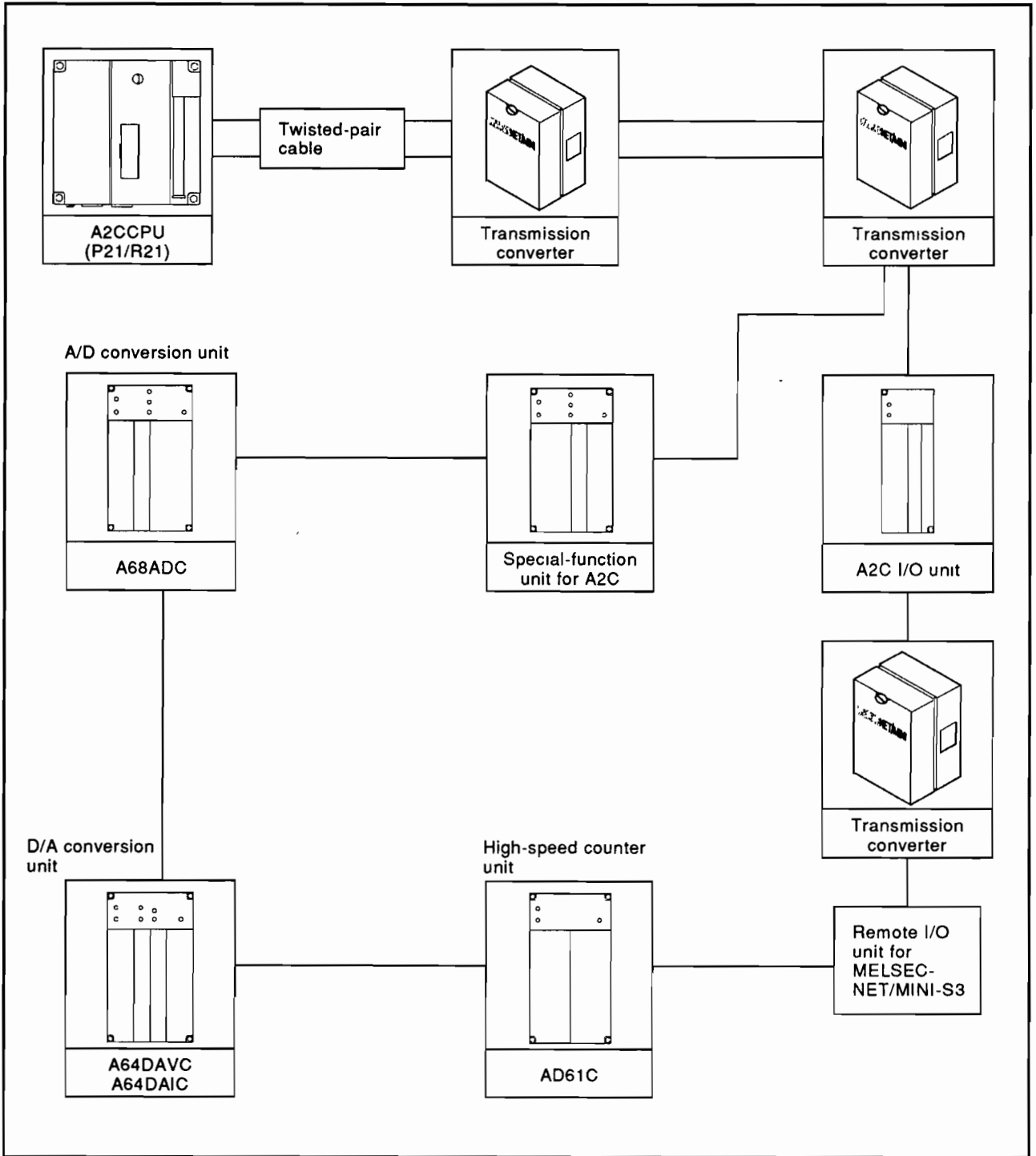
(1) NET/MINI system



2. SYSTEM CONFIGURATION

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(2) A2CCPU system



3. SPECIFICATIONS

This chapter describes general specifications, performance specifications, and cable specifications for the transmission converter.

3.1 General Specifications

General specifications for the transmission converter are indicated in Table 3.1.

Table 3.1 General specifications

Item	Specifications				
Operating ambient temperature	0 to 50°C(32 to 131°F)				
Storage ambient temperature	-20 to 75°C(-4 to 167°F)				
Operating ambient humidity	10 to 90% RH, no condensation				
Storage ambient humidity	10 to 90% RH, no condensation				
Vibration resistance	Conforms to **JIS C 0911	Frequency	Acceleration	Amplitude	Sweep Count
		10 to 55Hz	—————	0.075mm(0.003in)	10 times
		55 to 150Hz	9.8m/s ² {1g}	—————	* (1 octave/minute)
Shock resistance	Conforms to JIS C 0912 (98m/s ² {10g}, 3 times in 3 directions)				
Noise durability	By noise simulator 1500Vp-p noise voltage, 1μs noise width, and 25 to 60Hz noise frequency				
Dielectric withstand voltage	500V AC for 1 minute across batch of DC external terminals and ground				
Insulation resistance	5MΩ or larger by 500V AC insulation resistance tester across batch of AC external terminals and ground				
Grounding	Class 3 grounding; grounding is not required when it is impossible.				
Operating ambience	To be free from corrosive gases, oil, and chemicals. Dust should be minimal.				
Cooling method	Self-cooling				

Remarks

One octave marked * indicates a change from the initial frequency to double or half frequency. For example, any of the changes from 10Hz to 20Hz, from 20Hz to 40Hz, from 40Hz to 20Hz, and 20Hz to 10Hz are referred to as one octave.

**JIS: Japanese Industrial Standard

3.2 Performance specifications

Performance specifications for the transmission converter are indicated in Table 3.2.

Table 3.2 Performance specifications

Item \ Model		AJ35PTC-CNV	AJ35PTC-CNV-SI	AJ35PTC-CNV-GI	AJ35PP-CNV	AJ35PP-CNV-SI	AJ35PP-CNV-GI
Supply voltage to the unit		24V DC(15.6 to 31.2V)					
Current consumption in the unit		70mA					
Weight		1kg(2.2lb)					
MAX. transmission distance between stations	Twisted	*1 100(50)m/ 328(164)ft	*1 100(50)m/ 328(164)ft	*1 100(50)m/ 328(164)ft	—————	—————	—————
	Plastic	50m(164ft)	—————	—————	50m(164ft)	50m(164ft)	50m(55yd)
	SI type	—————	1km (1094yd)	—————	—————	1km (1094yd)	—————
	GI type	—————	—————	2km (2187yd)	—————	—————	2km (2187yd)
Connection cable		Twisted-pair cable ↑ ↓ Plastic fiber cable	Twisted-pair cable ↑ ↓ SI type optical fiber cable	Twisted-pair cable ↑ ↓ GI type optical fiber cable	Plastic fiber cable ↑ ↓ Plastic fiber cable	Plastic fiber cable ↑ ↓ SI type optical fiber cable	Plastic fiber cable ↑ ↓ GI type optical fiber cable
*2 Number of connectable units	*3 Bidirectional	20 units	8 units	4 units	20 units	8 units	4 units
	*4 Single-directional	40 units	16 units	8 units	40 units	16 units	8 units
Construction		In-panel specifications					

*1 Maximum transmission distance between stations varies according to the size of the twisted-pair cable.

(0.2mm² or longer to 0.5mm² 50m(164ft)
 (0.5mm² or longer100m(328ft)

*2 See Section 3.4.2

*3, *4 See Section 4.2.4

3.3 Cable Specifications

This section describes specifications for plastic fiber cable, SI type optical fiber cable, GI type optical fiber cable, and twisted-pair cable.

3.3.1 Plastic fiber cable specifications

Specifications for plastic fiber cable are indicated in Table 3.3.

Table 3.3 Plastic fiber cable specifications

Item	Specifications
Cable transmission loss	260dB/km(237dB/1000yd) or less
Optical fiber outside diameter	1000 μ m(0.039in)
Connector	1-core connector
Allowable bending radius	40mm(1.57in) or more

The cables conforming to the specifications in Table 3.3 are supplied by Mitsubishi Electric.

Purchase order types are indicated in Table 3.4.

Table 3.4 Purchase order types for plastic fiber cable

Purchase order type	Remark
M-2P-[]M-A	PVC sheathed core cable (standard type for indoor cabling, on UL spec.), cable diameter: 2.2mm(0.087in)
M-2P-[]M-B	Reinforced PVC sheathed core cable (reinforced type for indoor cabling), cable diameter: 5.0mm(0.197in)
M-2P-[]M-C	PE sheathed core cable (standard type for indoor cabling), cable diameter: 2.2mm(0.087in)

[] of purchase order type indicates the cable length (unit: m).

Example: PVC sheathed core cable of 40m: M-2P-40M-A

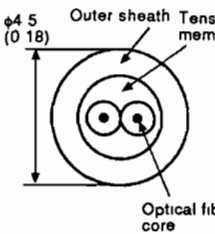
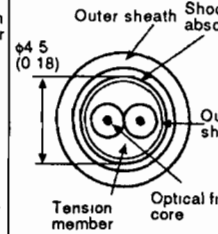
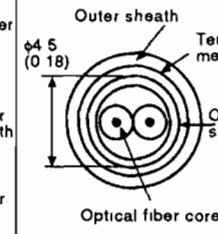
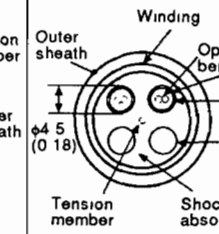
3. GENERAL DESCRIPTION

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3.3.2 SI type optical fiber cable specifications

Since the SI type optical fiber cable requires special skills and tools to connect it with the connector plug, which is also an exclusive part, consult a Mitsubishi representative to purchase it. Specifications for the SI type optical fiber cable are indicated in Table 3.5.

Table 3.5 SI type optical fiber cable specifications

Item	Standard Cable for Indoor Cabling	Reinforced Cable for Indoor Cabling	Standard Cable for Outdoor Cabling	Reinforced Cable for Outdoor Cabling	
Construction					
Cable diameter	4.5mm(0.18in)	8.5mm(0.34in)	8.5mm(0.34in)	14mm(0.55in)	
Allowable bending radius	50mm(1.97in) or more	85mm(3.35in) or more	85mm(3.35in) or more	140mm(5.51in) or more	
	φ4.5mm (0.18in) dia.	45mm(1.77in) or more	45mm(1.77in) or more	45mm(1.77in) or more	
	When cable is extended	90mm(3.54in) or more	170mm(6.69in) or more	170mm(6.69in) or more	280mm(11in) or more
Allowable tensile load	Cable	20kg(44lb)	20kg(44lb)	40kg(88lb)	60kg(132lb)
	φ4.5mm (0.18in) dia.	20kg(44lb)	20kg(44lb)	20kg(44lb)	20kg(44lb)
	Connector	3kg(6.6lb)			
Ambient temperature	-10 to 70°C(14 to 158°F)		-20 to 60°C(-4 to 140°F)		
Transmission loss	L type: Maximum 12dB/km(10.92dB/1000yd), *H type: Maximum 24dB/km(21.84dB/1000yd)				
Transmission band	Minimum 5MHz/km(4.55MHz·1000yd)				
Core diameter	200μm(8 thou. in) (SI type multi-component glass fiber)				
Clad diameter	250μm(9.8 thou. in) (SI type multi-component glass fiber)				
Number of cores	2 cores			2 cores x (1 to 4) pieces	
Weight	15kg/km (30lb/1000yd)	50kg/km (101lb/1000yd)	40kg/km (40lb/1000yd)	170kg/km (341lb/1000yd)	
Applicable connector	2-core optical connector plug (CA9003)				
Purchase order type	A-2P-[]M-A	A-2P-[]M-B	A-2P-[]M-C	A-2P-[]M-[]D	

Remarks

(1) Enter the cable length required in [] of purchase order type in Table 3.6.

- A-2P-[]M-A
- A-2P-[]M-B
- A-2P-[]M-C
- A-2P-[]M-[]D

Specify length. (Unit: m)
Example:20m
A-2P-20M-A

Specify the number of 2-core cords.

Example:Two 2-core cords of 30m length.
A-2P-30M-2D

(2) H type marked * can be used only when the distance between stations is 500m(1639ft) or less.

3. GENERAL DESCRIPTION

3.3.3 GI type optical fiber cable specifications

Since the GI type optical fiber cable requires special skills and tools to connect it with the connector plug, which is also an exclusive part, consult a Mitsubishi representative to purchase it.

Specifications for the 1-core GI type optical fiber cable are indicated in Table 3.6, and for the 2-core type are in Table 3.7.

Table 3.6 1-core GI type optical fiber cable specifications

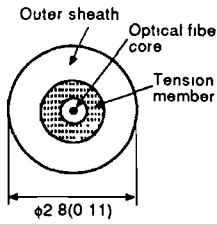
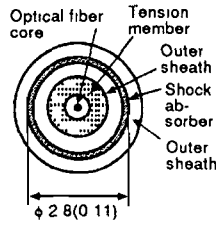
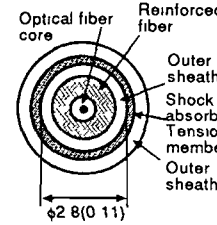
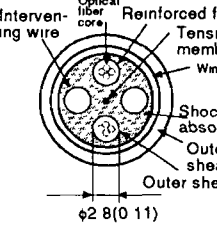
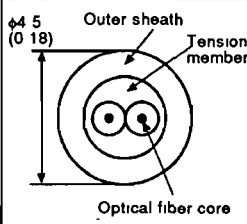
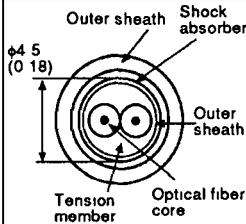
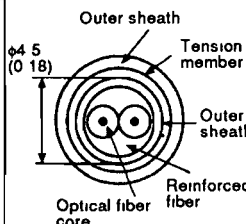
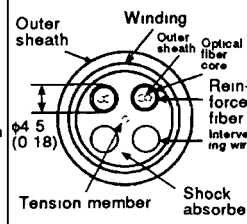
Item	Standard Cable for Indoor Cabling	Reinforced Cable for Indoor Cabling	Standard Cable for Outdoor Cabling	Reinforced Cable for Outdoor Cabling
Construction				
Cable diameter	2.8mm(0.11in)	6mm(0.24in)	6mm(0.24in)	13mm(0.51in)
Allowable bending radius	40mm(1.57in) or more			
Transmission loss	Maximum 3dB/km(2.73dB/1000yd)			
Transmission band	Minimum 300MHz/km(273MHz 1000yd)			
Core diameter	50μm(2 thou. in) GI type quartz fiber			
Clad diameter	125μm(4.9 thou. in) GI type quartz fiber			
Number of cores	1 core			1 core x (1 to 4) pieces
Applicable connector	1-core optical connector plug (CA9103S)			
Purchase order type	AGS-2P-[]M-A	AGS-2P-[]M-B	AGS-2P-[]M-C	AGS-2P-[]M-[]D

Table 3.7 2-core GI type optical fiber cable specifications

Item	Standard Cable for Indoor Cabling	Reinforced Cable for Indoor Cabling	Standard Cable for Outdoor Cabling	Reinforced Cable for Outdoor Cabling
Construction				
Cable diameter	4.5mm(0.18in)	8.5mm(0.34in)	8.5mm(0.34in)	15mm(0.59in)
Allowable bending radius	40mm(1.57in) or more			
Transmission loss	Maximum 3dB/km(2.73dB/1000yd)			
Transmission band	Minimum 300MHz/km(273MHz·1000yd)			
Core diameter	50μm(2 thou. in) GI type quartz fiber			
Clad diameter	125μm(4.9 thou. in) GI type quartz fiber			
Number of cores	2 cores			2 cores x (1 to 4) pieces
Applicable connector	2-core optical connector plug (CA9003S)			
Purchase order type	AG-2P-[]M-A	AG-2P-[]M-B	AG-2P-[]M-C	AG-2P-[]M-[]D

* Enter the following values in [] of purchase order type.

- Standard cable for indoor cabling
 - Reinforced cable for indoor cabling
 - Standard cable for outdoor cabling
 - Reinforced cable for outdoor cabling
- } Specify cable length. (Unit: m)
- } Specify both cable length (unit: m) and the number of 1-core/2-core cords.

Example:

Two 2-core cords of 30m length.

AG-2P-30M-2D

3.3.4 Twisted-pair cable specifications

Specifications for twisted-pair cable are indicated in Table 3.8.

Table 3.8 Twisted-pair cable specifications

Item	Specifications
Cable type	Shielded twisted-pair cable
Number of pairs	2P or more
Conductor resistance (20°C/68°F)	88.0Ω/km or less
Capacitance (1kHz)	60nF/km or less in average
Characteristic impedance (100kHz)	110±10Ω

3.4 Functions

This section describes functions of the transmission converter.

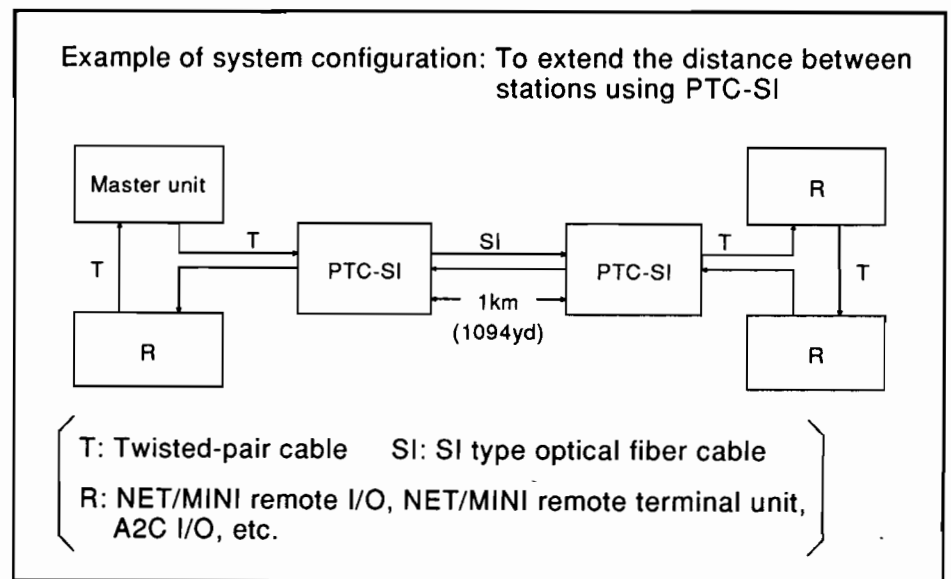
3.4.1 Conversion function

Conversion function is the function to convert plastic fiber cable, twisted-pair cable, SI type optical fiber cable, and GI type optical fiber cable to other cables, and 6 functions are available as shown below.

Model	Conversion function	
PTC-CNV	Twisted-pair cable	↔ Plastic fiber cable
PTC-SI	Twisted-pair cable	↔ SI type optical fiber cable
PTC-GI	Twisted-pair cable	↔ GI type optical fiber cable
PP-CNV	Plastic fiber cable	↔ Plastic fiber cable
PP-SI	Plastic fiber cable	↔ SI type optical fiber cable
PP-GI	Plastic fiber cable	↔ GI type optical fiber cable

By converting the cables, the following applications are available.

- (1) Unit for optical fiber cable can be connected in the network connected with the twisted-pair cable, or unit for twisted-pair cable can be connected in the network connected with the optical fiber cable. (PTC-CNV, PTC-SI, PTC-GI)
- (2) Maximum distance between stations can be extended from 50m(164ft) or 100m(328ft) to 1km(1094yd) by converting plastic fiber cable or twisted-pair cable to SI type optical fiber cable respectively, and to 2km(2187yd) by converting them to GI type optical fiber cable. (PTC-SI, PTC-GI, PP-SI, PP-GI)



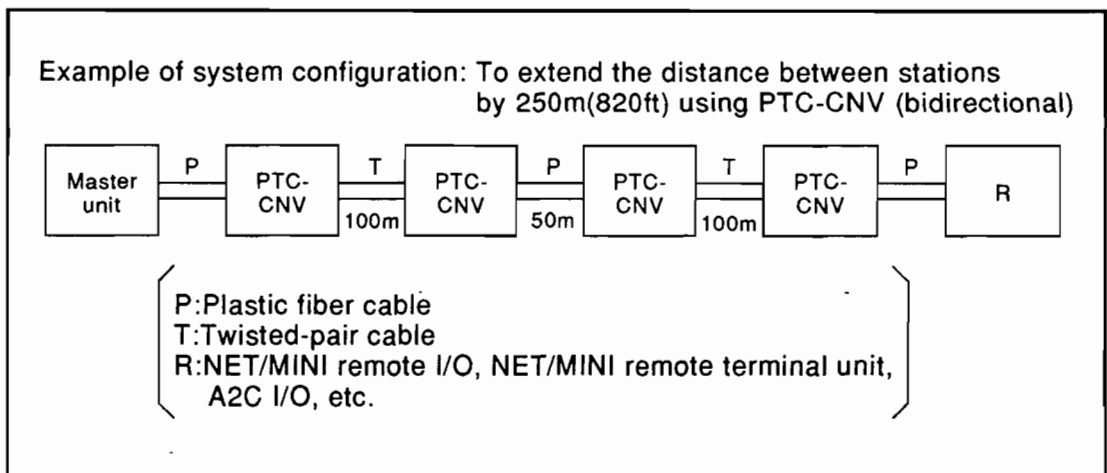
3.4.2 Relay repeater function

The relay repeater function is the function to use several connected converters as a relay box for extending the distance between stations.

(1) When using the same type of converters

The number of units which can be connected when the same type is used is shown below.

Model	Bidirectional	Single-directional
PTC-CNV	20 units	40 units
PP-CNV		
PTC-SI	8 units	16 units
PP-SI		
PTC-GI	4 units	8 units
PP-GI		



(2) When using different types

When using different types, the smallest number of connectable units should be applied.

Example:

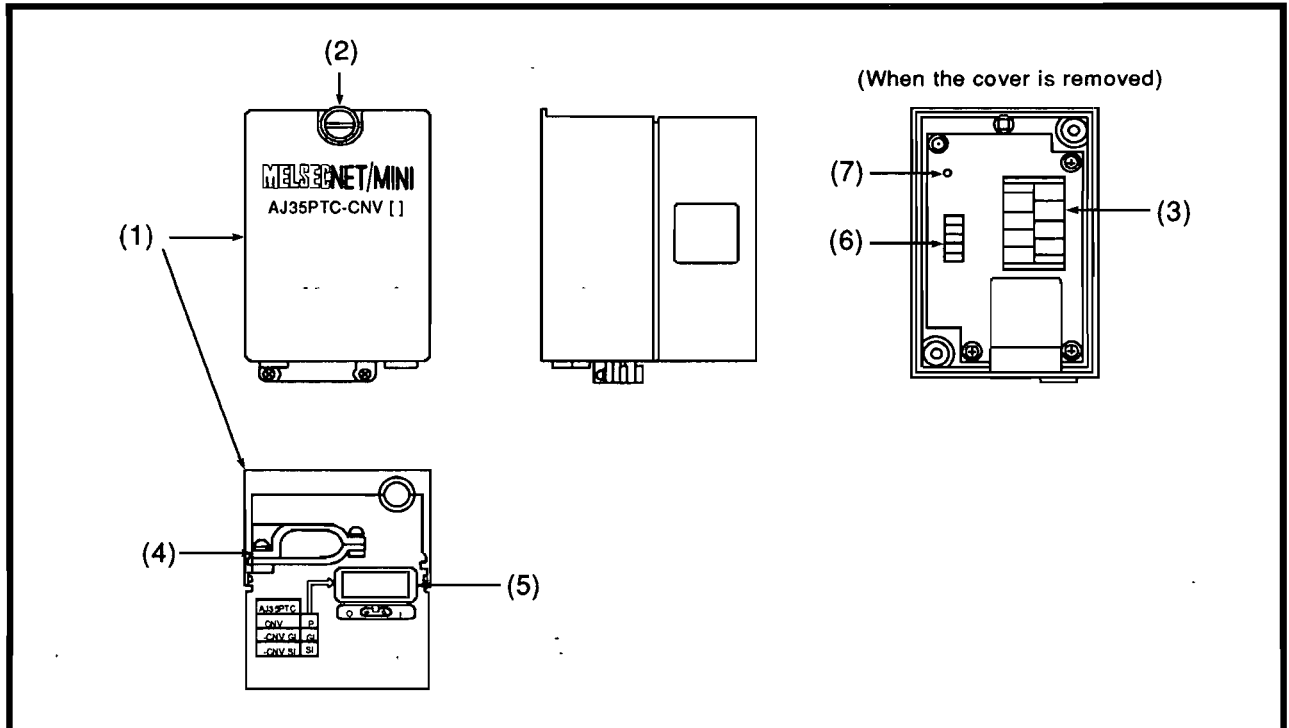
- (a) If there is PP-SI or PP-GI mixed ... bidirectional: 4 units, single-directional: 8 units
- (b) If there are PTC-CNV, PTC-SI, PP-CNV, and PP-SI mixed ... bidirectional: 8 units, single-directional: 16 units

4. NOMENCLATURE AND HANDLING

This chapter describes the nomenclature and attaching/removing procedures of the transmission converter.

4.1 Nomenclature

Nomenclature for the PTC-CNV (SI/GI) is shown below.

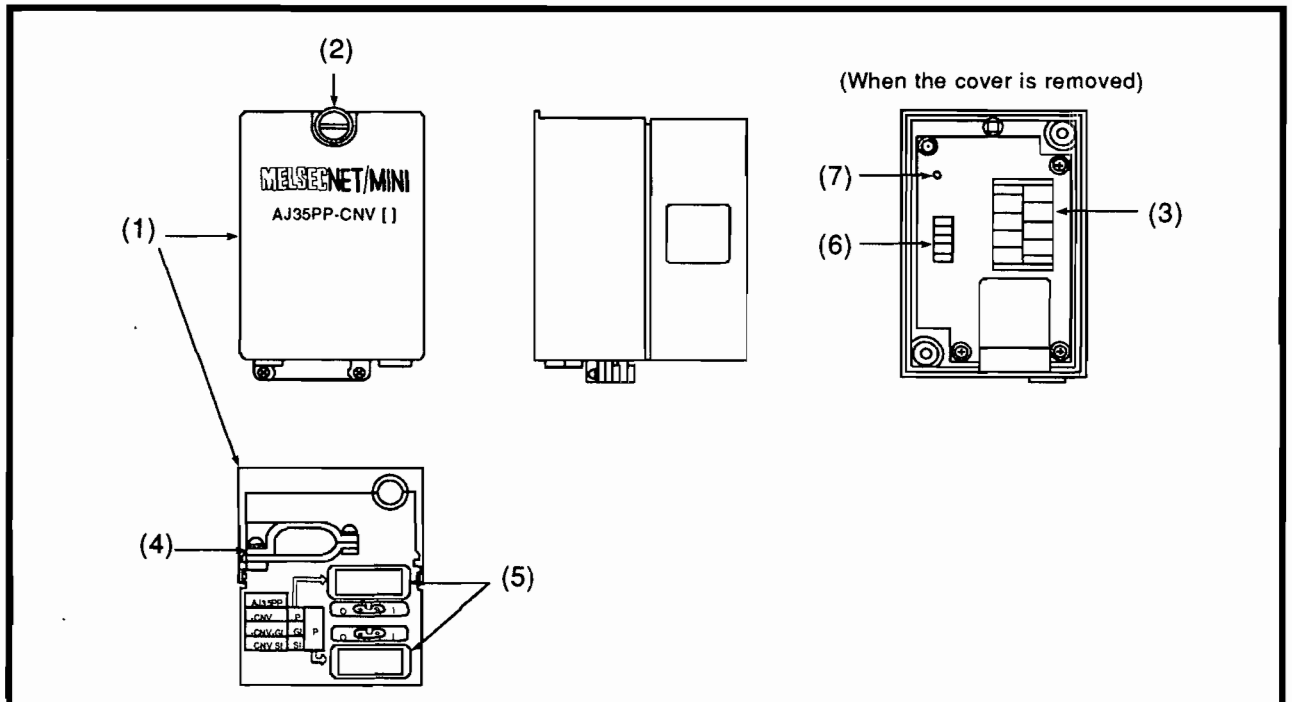


	Nomenclature	Contents															
(1)	Cover																
(2)	Cover fixing screw																
(3)	Terminal block for connecting 24V DC power supply with twisted-pair cable	<p>Connects the 24V DC power supply with twisted-pair cable.</p> <table border="1"> <tr> <td></td> <td>24G</td> <td>8</td> </tr> <tr> <td>+24V</td> <td>7</td> <td>FG</td> </tr> <tr> <td>SG</td> <td>5</td> <td>RDB</td> </tr> <tr> <td>RDA</td> <td>3</td> <td>SDB</td> </tr> <tr> <td>SDA</td> <td>1</td> <td></td> </tr> </table>		24G	8	+24V	7	FG	SG	5	RDB	RDA	3	SDB	SDA	1	
	24G	8															
+24V	7	FG															
SG	5	RDB															
RDA	3	SDB															
SDA	1																
(4)	Cable outlet	The cable should be sufficiently taped before being connected.															
(5)	Optical fiber cable connector	Connects plastic fiber cable, SI type optical fiber cable, and GI type optical fiber cable.															
(6)	LED	<p>Dim-ON : Data is being sent or received normally. Full-ON or OFF : Data is not being sent or received normally.</p> <table border="1"> <tr> <td></td> <td>RD1</td> </tr> <tr> <td></td> <td>SD1</td> </tr> <tr> <td></td> <td>RD2</td> </tr> <tr> <td></td> <td>SD2</td> </tr> </table>		RD1		SD1		RD2		SD2							
	RD1																
	SD1																
	RD2																
	SD2																
(7)	[POWER] LED	<p>ON : Power is supplied normally. OFF : Power is not supplied normally.</p>															

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Nomenclature for the PP-CNV (SI/GI) is shown below.



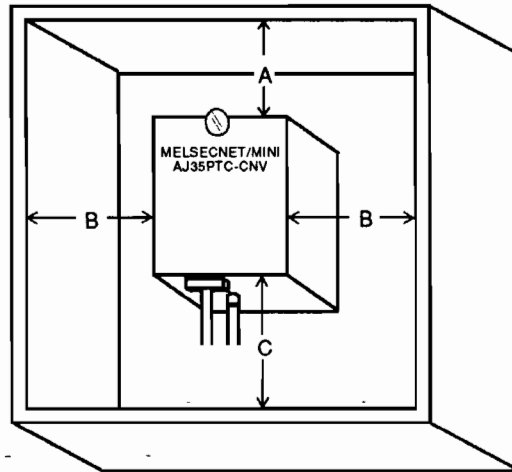
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	24G	8															
+24V	7	FG															
SG	5	NC															
NC	3	NC															
NC	1																
(4)	Cable outlet	The cable should be sufficiently taped before being connected.															
(5)	Optical fiber cable connector	Connects plastic fiber cable, SI type optical fiber cable, and GI type optical fiber cable.															
(6)	LED	Dim-ON : Data is being sent or received normally. Full-ON or OFF : Data is not being sent or received normally. <table border="1" style="margin-left: 20px;"> <tr> <td></td> <td>RD1</td> </tr> <tr> <td></td> <td>SD1</td> </tr> <tr> <td></td> <td>RD2</td> </tr> <tr> <td></td> <td>SD2</td> </tr> </table>		RD1		SD1		RD2		SD2							
	RD1																
	SD1																
	RD2																
	SD2																
(7)	「POWER」 LED	ON : Power is supplied normally. OFF : Power is not supplied normally.															

4.2 Handling

This section describes the handling instructions for the transmission converter.

4.2.1 Handling instructions

The following space should be secured because the transmission converter is installed in the panel.



A(mm/in)	B(mm/in)	C(mm/in)
80/3.15	50/1.97	150/5.91

POINT

Allowable bending radii are specified for plastic fiber cable, SI type optical fiber cable, and GI type optical fiber cable respectively. To use plastic fiber cable, SI type optical fiber cable, or GI type optical fiber cable bent in the panel, more space than the allowable bending radii specified in Section 3.3 is required when laying the cables.

4.2.2 Handling instructions for optical fiber/twisted-pair cable

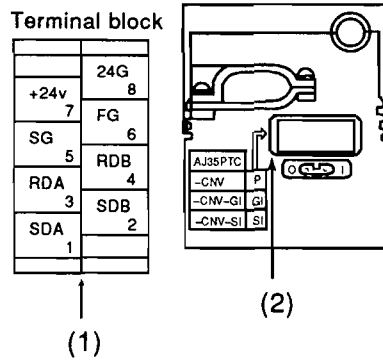
If optical fiber cables and twisted-pair cables are handled roughly, they will be damaged. Therefore:

- (1) Do not press with a sharp and rigid body.
- (2) Do not twist the cable.
- (3) Do not tension the cable. (more than allowable tension)
- (4) Do not step on the cable.
- (5) Do not put anything on the cable.
- (6) Do not make any flaw on the cable sheath.

4.2.3 Connection of cables

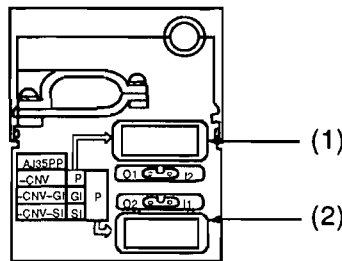
Connection of the cables is described below.

(1) For PTC-CNV (SI/GI)



Model	(1) Terminal block for connecting 24V DC power supply and twisted-pair cable	(2) Optical fiber cable connector
PTC-CNV	24V DC power supply and twisted-pair cable	Plastic fiber cable
PTC-SI	24V DC power supply and twisted-pair cable	SI type optical fiber cable
PTC-GI	24V DC power supply and twisted-pair cable	GI type optical fiber cable

(2) For PP-CNV (SI-GI)



Model	(1) Optical fiber cable connector	(2) Optical fiber cable connector
PP-CNV	Plastic fiber cable	Plastic fiber cable
PP-SI	SI type optical fiber cable	Plastic fiber cable
PP-GI	GI type optical fiber cable	Plastic fiber cable

POINT

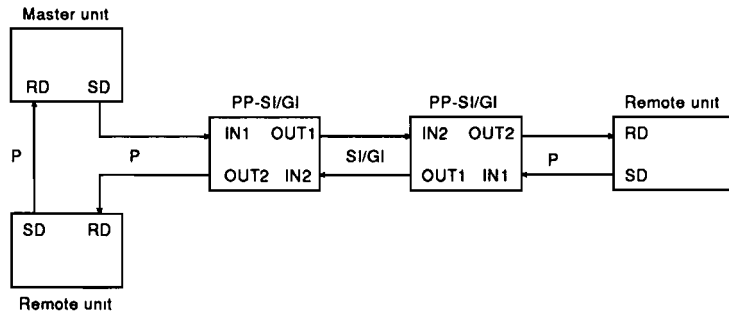
For connecting procedures for 24V DC power supply and twisted-pair cable to the terminal block, refer to the sections for cable connection in the User's Manual for MELSECNET/MINI-S3 Master module, type AJ71PT32-S3 or the User's Manual for A2CCPU (P21/R21).

4.2.4 Connection of optical fiber cable

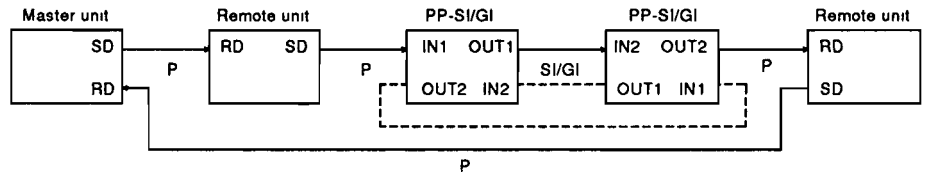
Cable connection and procedures for connecting and disconnecting the optical fiber cables are described below.

(1) Example of PP-SI/GI connection

(a) Bidirectional connection

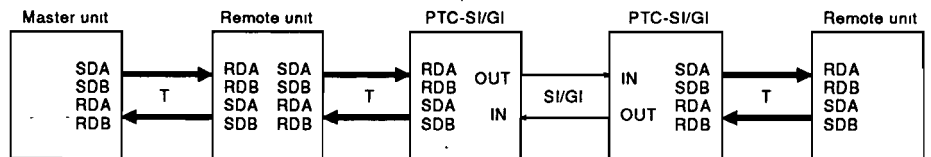


(b) Single-directional connection

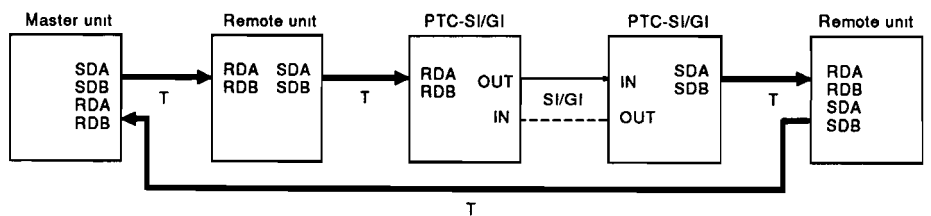


(2) Example of PTC-SI/GI connection

(a) Bidirectional connection



(b) Single-directional connection



T: Twisted-pair cable

P: Plastic fiber cable

SI/GI: SI type optical fiber cable/GI type optical fiber cable

Bidirectional: Data is transmitted in both directions.

(Receive → Send, — — → Receive → Send)

Single-directional: Data is transmitted in one direction.

Receive → Send only.

(3) Plastic fiber cable is connected as shown in Fig 4.2.

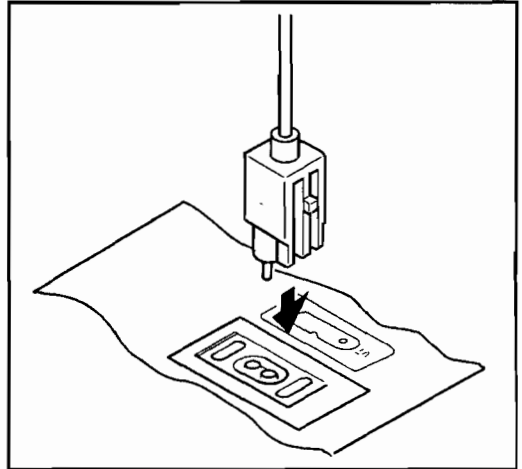
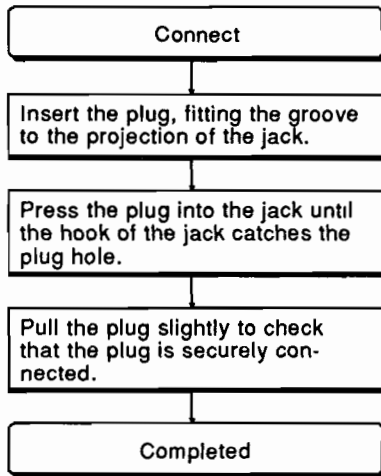


Fig. 4.2 Connection of plastic fiber cable

(4) Plastic fiber cable is disconnected as shown in Fig. 4.3.

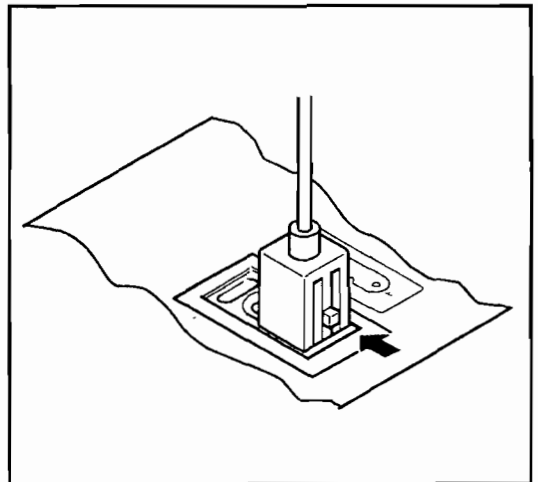
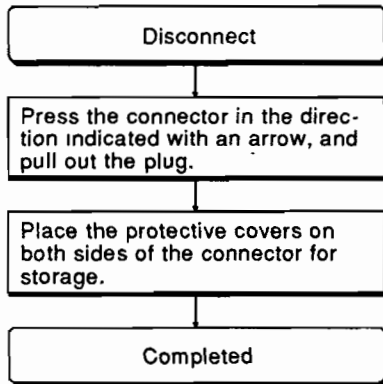


Fig. 4.3 Disconnection of plastic fiber cable

(5) Connection of optical fiber cable

SI/GI type optical fiber cable is connected as shown below.

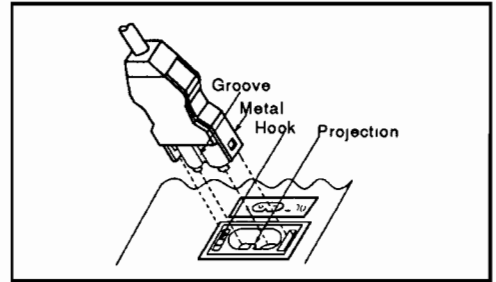
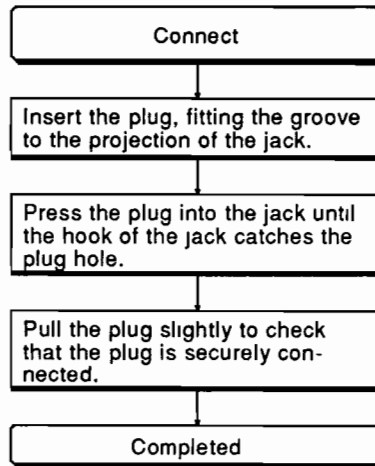


Fig. 4.4.1 Connection of optical fiber cable

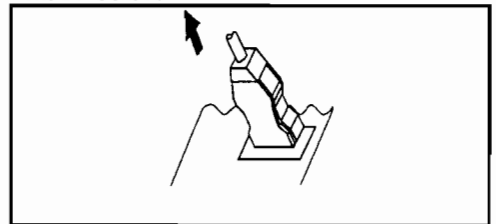


Fig. 4.4.2 Connection of optical fiber cable (check)

(6) Disconnection of optical fiber cable

SI/GI type optical fiber cable is disconnected as shown below.

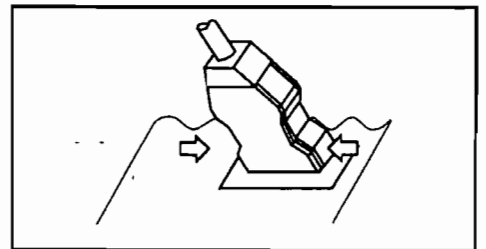
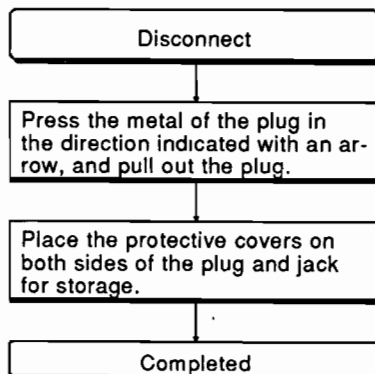
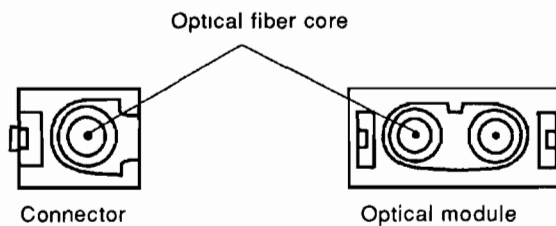


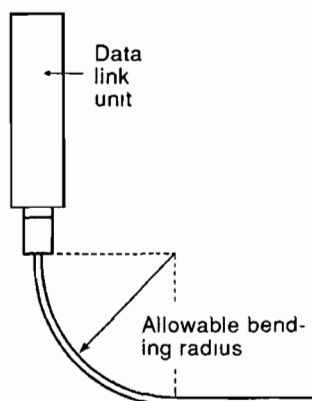
Fig. 4.5 Disconnection of optical fiber cable

POINT

- (1) Do not touch the optical fiber cores of the connector or optical module and protect from dirt and dust. Always fit the protective covers for storage. Dirt, dust, or oil of hands will increase the transmission loss and may cause a failure on the data link.



- (2) Bending radius of the optical fiber cable should be equal or larger to than the allowable bending radius.



Sufficient care should be taken because if the radius is smaller than the allowable bending radius, the optical fiber cable may be broken and the data link cannot be continued.

5. TROUBLESHOOTING

This chapter describes a brief troubleshooting procedure to communicate with the transmission converter.

Check the lines or communicating relationship in the master unit for abnormality first. If any abnormality is found, open the cover of the transmission converter.

For any trouble relating to the master unit, refer to the User's Manual for the relevant master unit.

5.1 When "POWER" LED is OFF

Check item	Corrective action
Is 24V DC power is supplied?	Check the external cabling.

5.2 When SD/RD LED is full-ON or OFF

Check item	Corrective action
Is any cable broken within the loop?	Check the cabling.
Is the cable connected properly?	

If all the above check items are normal, H/W may be abnormal. Please contact your nearest MITSUBISHI representative with details of the trouble.

APPENDICES

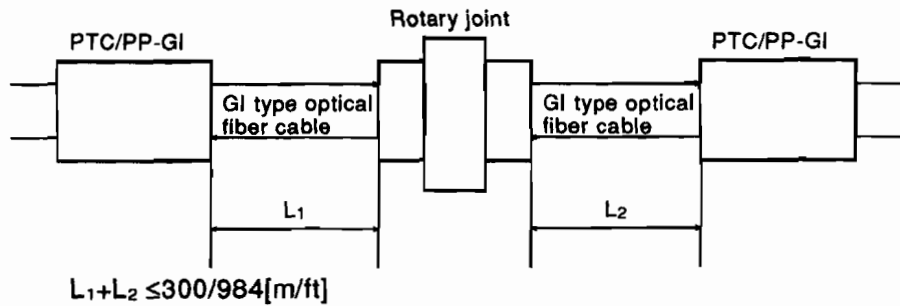
APPENDIX 1 Optical rotary joint

Recommended optical rotary joints and connectors are shown below.

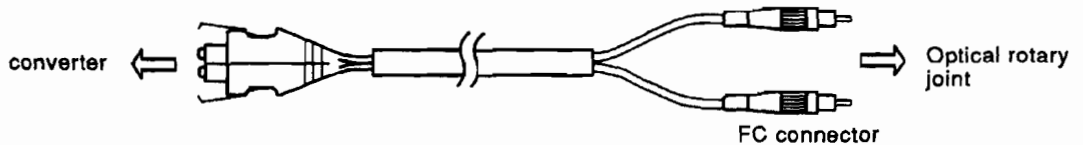
Model	Item	Description	Remarks
Optical rotary joint	Manufacturer	Hitachi Densen	[] shows the number of cores.
	Type	HRJ-[]G7-S	
Optical fiber cable with FC-CA connector	Connector	CA9103S	Dealt with by Mitsubishi Electric
		CN5101 (compatible with FC)	
	Purchase order type	AGS-FC-CA-[]M-2B (for indoor)	[] shows the length of the optical fiber cable (unit: m).
		AGS-FC-CA-[]M-2D (for outdoor)	

Cautions:

- (1) The optical fiber cable should be GI type.
- (2) Overall length of the GI type optical fiber cable should be 300m(984ft) or less. (See the following figure.)

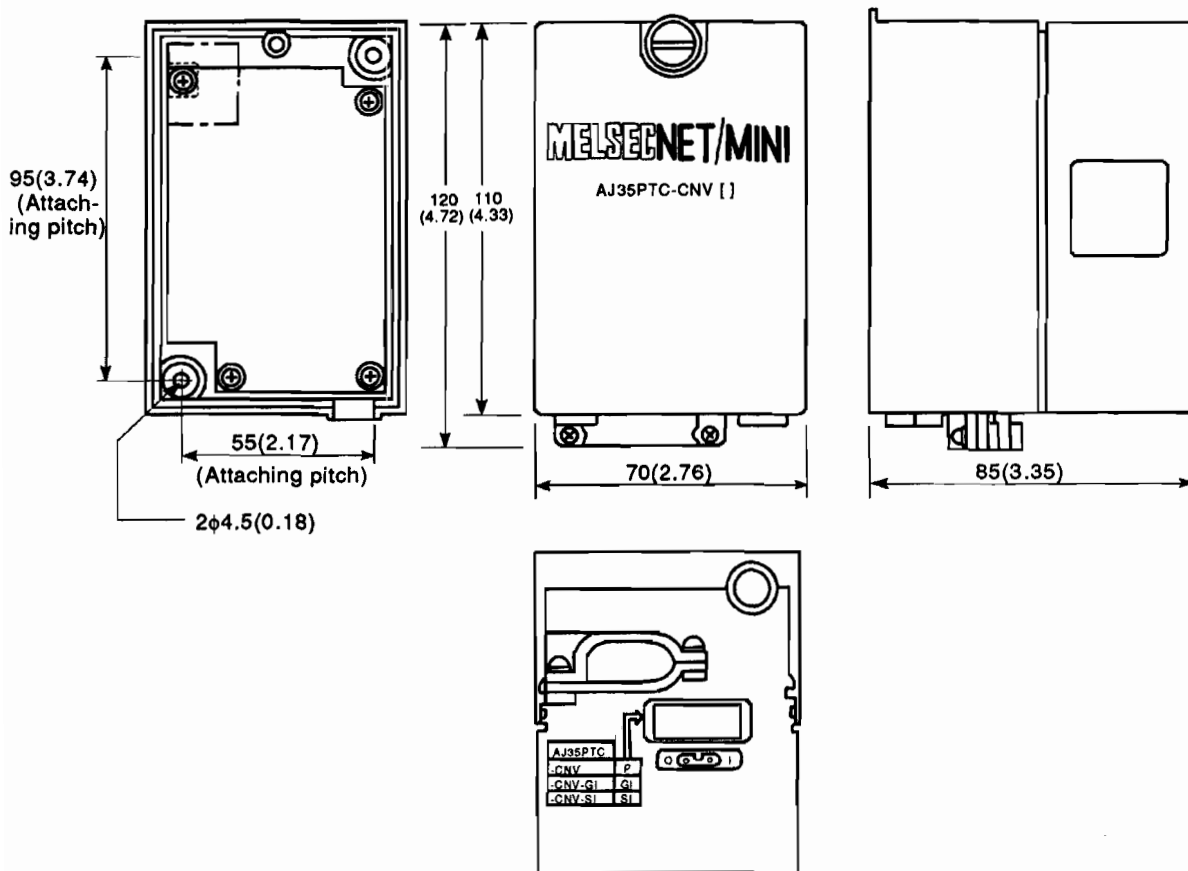


- (3) FC connector should be placed on the optical rotary joint side. (See the following figure.)



APPENDIX 2 Outside dimension diagram

The outside dimensions are common to all the models.



Unit: mm(inch)

IMPORTANT

The components on the printed circuit boards will be damaged by static electricity, so avoid handling them directly. If it is necessary to handle them take the following precautions.

- (1) Ground human body and work bench.
- (2) Do not touch the conductive areas of the printed circuit board and its electrical parts with any non-grounded tools etc.



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