

# mitsubishi

# A9GT-QJ71LP23/A9GT-QJ71BR13 Network Unit

## User's Manual

Thank you for purchasing Mitsubishi Graphic Operation Terminal GOT series.

Prior to use, please read both this manual and detailed manual thoroughly to fully understand the product.



MODEL	A9GT-QJ71LP23/BR13-U
MODEL CODE	1DM000
IB(NA)- 0800283-B(0512)MEE	

Mitsubishi Graphics Operation Terminal

# ● SAFETY PRECAUTIONS ●

(Always read before starting use)

When using this equipment, thoroughly read this manual. Also pay careful attention to safety and handle the module properly.

These precautions apply only to this equipment.

Refer to the user's manual of the CPU module to use for a description of the PLC system safety precautions.


These "Safety Precautions" classify the safety precautions into two categories: "DANGER" and "CAUTION".



Procedures which may lead to a dangerous condition and cause death or serious injury, if not carried out properly.



Procedures which may lead to a dangerous condition and cause superficial to medium injury, or physical damage only, if not carried out properly.

Depending on circumstances, procedures indicated by  **CAUTION** may also be linked to serious results.

In any case, it is important to follow the directions for usage.

Store this manual in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.

## [DESIGN PRECAUTIONS]

### **DANGER**

- If a communication fails in data link, the faulty station holds the data link data generated before the communication error. Create an interlock circuit in the sequence program using the communication status information in order that the system will operate safely.  
Check the faulty station and the operation status during communication error by referring to the relevant manuals.
- Some failures of cable or communication unit may cause the GOT to keep the outputs on or off.  
Create an external circuit for monitoring output signals that may lead to serious accidents.  
Failure to do so may cause mis-outputs or malfunctions, resulting in accidents.

## [DESIGN PRECAUTIONS]

### DANGER

- If a communication error (including cable disconnection) occurs during monitoring, the communication between the GOT and PLC CPU may be interrupted and the GOT may be inoperative.  
For bus connection : The PLC CPU is down and the GOT is inoperative.  
For other than above : The GOT is inoperative.  
When configuring a system including the GOT, the possibility of GOT communication error must be considered; make sure the operation significant for the system will be performed by switches on devices other than the GOT.  
Failure to do so may cause mis-outputs or malfunctions, resulting in accidents.

### CAUTION

- Do not install the communication cables together with the main circuit or power lines, or bring them close to each other. The distance of 100mm(3.9inch) or more should be ensured. Failure to do so may cause malfunctions due to noise.

## [INSTALLATION PRECAUTIONS]

### CAUTION

- Use the unit in the environment specified in the GOT user's manual.  
Failure to do so may cause electric shock, fires, malfunctions, product deterioration or damage.
- Make sure to externally shut off all phases of the GOT power supply before mounting/removing the unit onto/from the GOT.
- Make sure to mount the unit to the GOT interface and tighten the unit fixing screws within the specified torque.  
Incorrect mounting may cause malfunctions, failures or a fall of the unit.  
Loose tightening may cause a fall of the unit, short circuits, or malfunctions.  
Overtightening may damage the screws and/or the unit, resulting in a fall of the unit, short circuits or malfunctions.
- Do not directly touch the conductive part or electronic components of the unit.  
This may cause the unit to fail or malfunction.

## [WIRING PRECAUTIONS]

### **DANGER**

- Make sure to externally shut off all phases of the system power supply before wiring.  
Failure to do so may cause electric shock, product damage or malfunctions.

### **CAUTION**

- Be careful not to let foreign matter such as dust or wire chips get inside the unit. This may cause a fire, failure or malfunctions.
- Make sure to securely connect the cable to the connector of unit.  
Incorrect connection may cause malfunctions.
- Make sure to fix communication cables and power cables to the unit by ducts or clamps. Failure to do so may cause damage of the unit or the cables due to accidental pull or unintentional shifting of the cables, or malfunctions due to poor contact of the cables.
- Do not hold the communication cable by hand and pull it out from the unit.  
When removing the cable from the unit, make sure to hold the connector by hand and pull it.  
Failure to do so may cause malfunctions or damage to the unit or cable.
- Solder the coaxial cable connector correctly.  
Incomplete soldering may cause a malfunction.

## [STARTUP AND MEINTENANCE PRECAUTIONS]

### **DANGER**

- Do not touch the connector while power is on.  
Failure to do so may cause electric shock or malfunctions.
- Make sure to externally shut off all phases of the GOT power supply before cleaning the unit.  
Failure to do so may cause the unit to fail or malfunction.

### **CAUTION**

- Do not assemble or modify the unit.  
This may cause failures, malfunctions, injury or fire.
- Do not directly touch the conductive part or electronic components of the unit. This may cause the unit to fail or malfunction.
- Do not change the switch settings while power is on.  
This may cause failures or malfunctions.
- Make sure to externally shut off all phases of the power supply before cleaning the unit and retightening unit mounting screws.  
Failure to do so may cause the unit to fail or malfunction.  
Loose tightening may cause a fall of the unit, short circuits, or malfunctions.  
Overtightening may damage the screws and/or the unit, resulting in a fall of the unit, short circuits or malfunctions.
- Before handling the unit, touch a grounded metal or similar object to discharge the static electricity from the human body.  
Failure to do so may cause the unit to fail or malfunction.

# [DISPOSAL PRECAUTIONS]

## ⚠ CAUTION

- Handle the product as industrial waste when disposing it.

### Revisions

\* The manual number is noted at the lower left of the back cover.

Print Date	*Manual Number	Revision
Jan., 2004	IB(NA)-0800283-A	First printing
Dec., 2005	IB(NA)-0800283-A	<div style="border: 1px solid black; display: inline-block; padding: 2px;">Partial corrections</div> Chapter 6

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# CONTENTS

1. Overview.....	1
2. Specification .....	2
2.1 General Specifications .....	2
2.2 Performance Specifications.....	2
3. Part Names and the Settings .....	3
4. Installation Procedure .....	6
5. Precautions for Laying Cables .....	7
5.1 Precautions for cable connection (A9GT-QJ71LP23) .....	7
5.2 Precautions for cable connection (A9GT-QJ71BR13) .....	8
6. External Dimensions .....	9

## Manuals

The following manuals are relevant to this product.  
Refer to the following list and order the required manuals.

### Detailed Manual

Manual name	Manual No. (Model code)
A985GOT/A975GOT/A970GOT/A960GOT User's Manual (option)	SH-4005 (13JL70)
A950GOT/A951GOT/A953GOT/A956GOT User's Manual (option)	SH-080018 (13JL92)

### Relevant Manuals

For relevant manuals, refer to the PDF manual stored within the drawing software.

# 1. Overview

This manual explains the A9GT-QJ71LP23/A9GT-QJ71BR13 network unit (hereinafter referred to as network unit), i.e., the specifications, switch settings and how to mount onto the GOT.

The A9GT-QJ71LP23 and A9GT-QJ71BR13 allow the GOT to function as a normal station (MELSECNET connection) in the MELSECNET/10 network system.

These new network units enable the monitoring in the QCPU and QnACPU device range, whereas the old network units (A7GT-J71LP23, A7GT-J71BR13) enable monitoring in the AnACPU device range only.

- When using the A9GT-QJ71LP23 or A9GT-QJ71BR13, the device range that can be monitored varies with the communication driver installed in the GOT.

Communication driver*1	PLC CPU to be monitored				
	QCPU (Q mode)	QnACPU	QCPU (A mode)	ACPU	MELDAS C6/C64
MNET10(A/QnA/Q)	●	●	●	●	●
MNET10(A)	▲	▲	●	●	-

● : Can be monitored.

▲ : Can be monitored within the AnA device range as follows:

For timer (T), counter (C): access range of 0 to 255.

For file register (R, ER, ZR): cannot be monitored.

- : Cannot be monitored.

\*1: Each communication driver is installed in the following drawing softwares.

MNET10(A/QnA/Q): GT Works2 Version1.09K and later/GT Designer2 Version1.09K and later

MNET10 (A): GT Works (2) first version and later/ GT Designer (2) first version and later

- For precautions when replacing the A7GT-J71LP23/A7GT-J71BR13 with the A9GT-QJ71LP23/A9GT-QJ71BR13, refer to GOT-A900 Series User's Manual (Connection System Manual).
- The MELSECNET/H can work in the MELSECNET/10 mode.  
For system configuration when connecting the GOT to MELSECNET, refer to GOT-A900 Series User's Manual (Connection System Manual).

After unpacking the product, check if the followings are included in the package.

Model	Product	Quantity
A9GT-QJ71LP23	A9GT-QJ71LP23 network unit (for optical loop network connection; normal station only)	1
A9GT-QJ71BR13	A9GT-QJ71BR13 network unit (for coaxial bus network connection; normal station only)	1
	F- type connector	1

## Important

In the case of coaxial-type network system, terminal resistors must be attached to both terminal stations of the network. The A9GT-QJ71BR13 does not include terminal resistors. Therefore, they should be prepared by the user.

\*Terminal resistor (75Ω)

- A6RCON-R75
- BCN-TMP-05 (75) (HIROSE ELECTRIC CO., LTD.)

## 2. Specification

### 2.1 General Specifications

For general specifications, refer to the user's manual of the GOT used.

### 2.2 Performance Specifications

The following table provides the A9GT-QJ71LP23/A9GT-QJ71BR13 performance specifications.

Item		A9GT-QJ71LP23	A9GT-QJ71BR13	
Maximum number of link points per network	LX/LY	8192 points		
	LB	8192 points		
	LW	8192 points		
Maximum number of link points per station	$\frac{B + Y}{8} + 2 \times W \leq 2000$ bytes			
Communication speed	10Mbps (20 Mbps : multiples transmission)		10Mbps	
Communication method	Token ring method		Token bus method	
Synchronous method	Frame synchronous			
Type of transmission channel	Duplex loop		Coaxial single bus	
Overall distance	30 km (18.6 mil) For SI cable H type Distance between stations: 500m For SI cable L type Distance between stations: 300m		3C-2V	300m (0.19 mil) (Distance between stations: 300m (0.19 mil) *1
	For QSI cable Distance between stations: 1km		5C-2V	500m (0.31 mil) (Distance between stations: 500m (0.31 mil) *1
Accessible network range	Same network only			
Maximum number of groups	9			
Number of stations connected to a network	63 stations		31 stations	
RAS functions	<ul style="list-style-type: none"> <li>• Loopback in case of error detection or cable disconnection (Specific to A9GT-QJ71LP23)</li> <li>• Link channel check for the host station</li> <li>• Error detectopm by using special relays and registers</li> <li>• Various diagnostic functions</li> </ul>			
Transient transmission	<ul style="list-style-type: none"> <li>• N:N communication</li> </ul>			
Cable	Optical fiber cable SI-200/220, SI-200/250, QSI-185/230 (Arranged by user *2)		3C-3V 5C-2V or equivalent	
Applicable connectors	2-core optical connettor plug DL-72ME (For SI-200/250) CA7003, CA7005 (For SI-200/220 and QSI-185/230)		BNC-P-3-NiCAu BNC-P-5-NiCAu (DDK) or equivalent	
Cable transmission loss	12dB/km or less	5.5 dB/km or less	Conforms to JIS C 3501	
Internal current consumption	0.5A			
Weight	0.35 kg (0.77 lb)			

\*1: In the case of coaxial bus system, the cable length between stations may be restricted, depending on the number of connected stations. (Refer to Section 5.2 (1).)

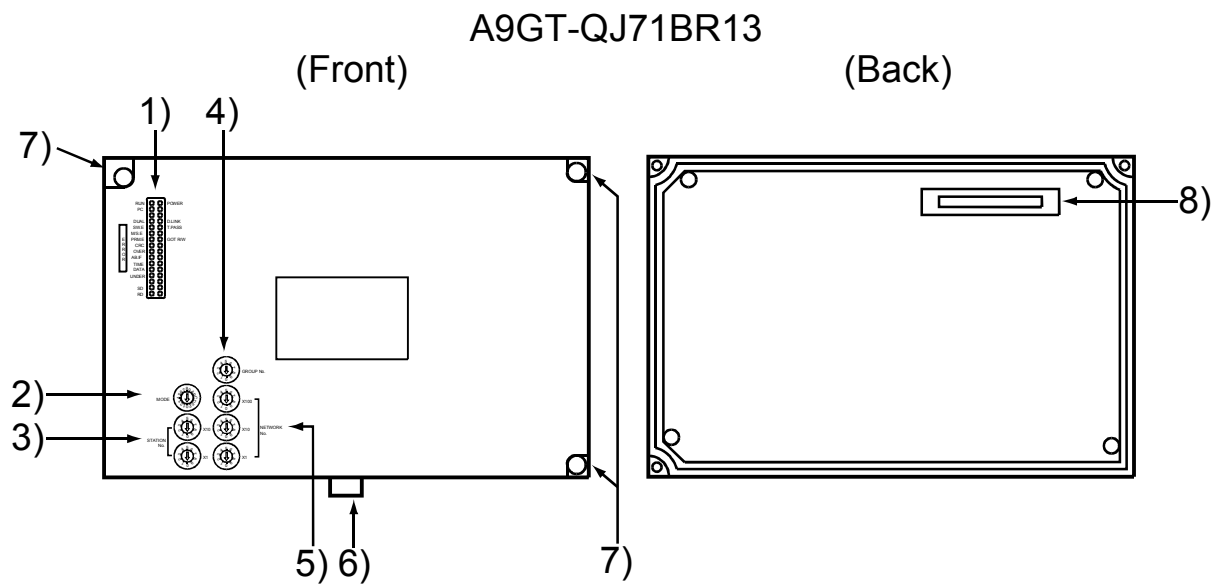
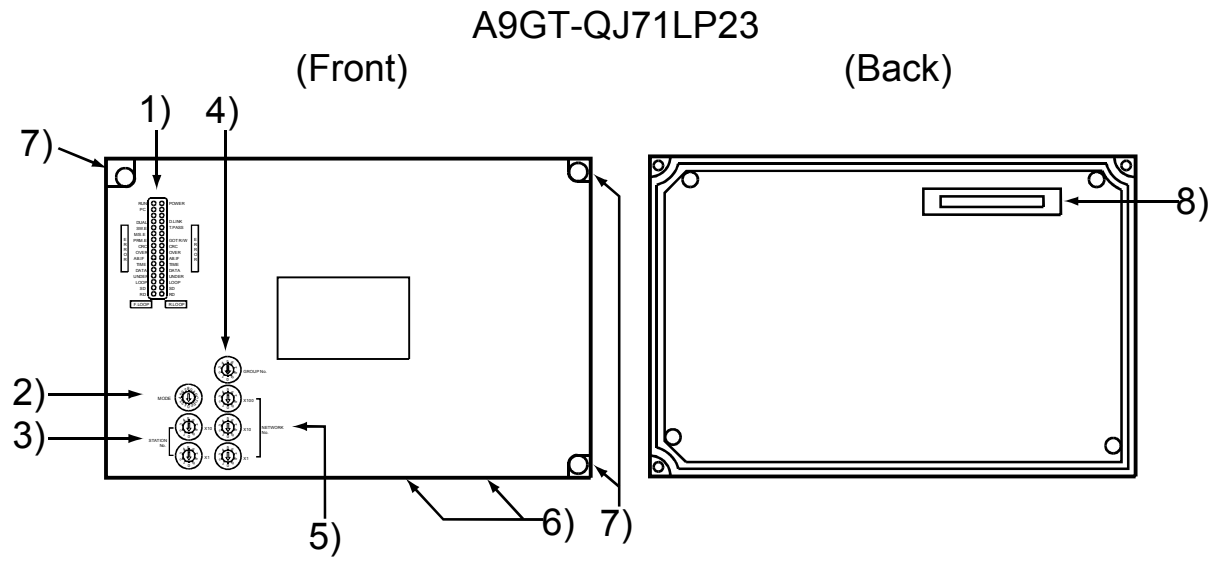
\*2: Please note that use of optical fiber cable requires the expertise, special tools and dedicated connector for connection. Please contact your local Mitsubishi Electric System Service or representative, for the purchase of the required items.

\*3: The noise durability, dielectric withstand voltage, and insulation resistor depends on the GOT power supply type (AC or DC).

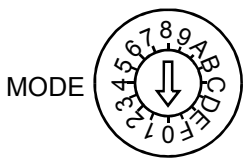
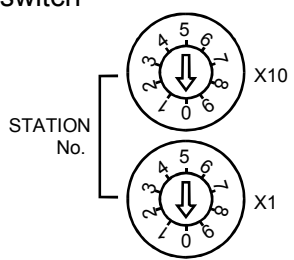
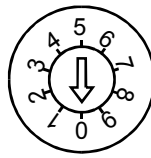
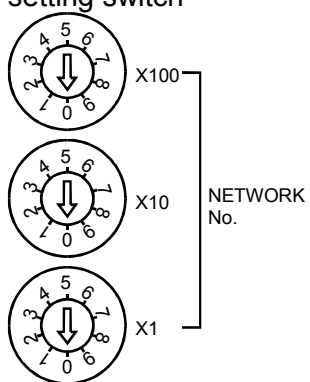


### 3. Part Names and the Settings

The following indicates part names and the setting of each part of A9GT-QJ71LP23 and A9GT-QJ71BR13.



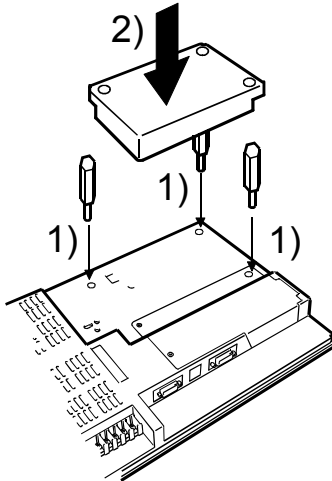
No.	Name	Details	
1)	<p><b>LED</b></p> <p><b>A9GT-QJ71LP23</b></p> <p><b>A9GT-QJ71BR13</b></p>	<b>Name</b>	<b>Details</b>
		RUN	On : Normal operation Off : The WDT error has occurred.
		PC	On : Set to the PLC-to-PLC network (Always ON)
		DUAL	On : Multiple transmission is being executed. Off : Multiple transmission is not being executed.
		SW.E	On : No.2 to 5 switch settings are incorrect. Off : Normal
		M/S.E	On : Station No. settings are overlapped on the same network. Off : Normal
		PRM.E	On : An error has occurred because common parameters are inconsistent with station-specific parameters, i.e., parameters received from sub-control station are different from those of host station (received from control station). Off : Normal
		POWER	On : Power is supplied. Off : Power is not supplied.
		D.LINK	On : Data link is being executed. Off : Data link is not being executed.
		T.PASS	On : Participating in the button passing. Off : Not participating in the button passing.
		GOR R/W	On : Communicating with GOT Off : Not communicating with GOT
		CRC	On : An error has occurred, i.e., an error code is detected in the received data. <Cause> The timing when the station that sends data to the corresponding station is disconnected, H/W failure, cable failure, noise, etc. Off : Normal
		OVER	On : An error has occurred, i.e., the received data processing is delayed. <Cause> H/W failure, cable failure, noise, etc. Off : Normal
		AB.IF	On : An error has occurred, i.e., "1" is continuously received more than specified times, or the received data length is too short. <Cause> The timing when the station that sends data to the corresponding station is disconnected, H/W failure, cable failure, noise, etc. Off : Normal
		TIME	On :When the baton has not been passed to the host station within the monitor time. <Cause> Short monitor time, cable failure, noise, etc. Off : Normal
		DATA	On : An error has occurred, i.e., an error code is received. <Cause> Cable failure, noise, etc. Off : Normal
		UNDER	On : An error has occurred, i.e., the internal processing of the data to be sent is not executed at constant intervals. <Cause> H/W failure. Off : Normal
		LOOP	On : An error has occurred in forward loop/reverse loop. <Cause> The adjacent station power is off, cable is disconnected/unconnected. (Specific to A9GT-QJ71LP23) Off : Normal
		SD	Barely on : Data transmitting
		RD	Barely on : Data transmitting *2

No.	Name	Details		
2) *3	Mode setting switch 	Setting of mode (Factory setting at time of shipping: 0)		
		Mode	Name	Contents
		0	On-line (automatic double line existent)	Data link (automatic double line existent)
		1	Use not possible	
		2	Off-line	Placing local station in parallel condition
		3	Test mode 1	Loop test (Forward loop)
		4	Test mode 2	Loop test (Reverse loop)
		5	Test mode 3	Station-to station test (Master station)
		6	Test mode 4	Station-to station test (Slave station)
		7	Test mode 5	Self- loopback test
		8	Test mode 6	Internal self- loopback test
		9	Test mode 7	Hardware test
		A	-	Unusable
		B	-	Unusable
C	-	Unusable		
D	Test mode 8	Network number confirmation (LED indication)		
E	Test mode 9	Group number confirmation (LED indication)		
F	Test mode 10	Station number confirmation (LED indication)		
3) *3	Station number setting switch 	Station number setting (factory setting at time of shipping: 1) <Setting range> 1 to 64 :station number Other than 1 to 64 :setting error (SW.E LED lamp is lit)		
4) *3	Group number setting Switch 	Group number setting (factory setting at time of shipping: 0) <Setting range> 0 : No group setting 1 to 9 : Group number		
5) *3	Network number setting switch 	Network number setting (factory setting at time of shipping: 1) <Setting range> 1 to 239 :Network number Other than 1 to 239:Setting error (SW.E LED lamp is lit)		
6)	Connector	A9GT-QJ71LP23: Connect the optical fiber cable. A9GT-QJ71BR13: Connect the F-type connector		
7)	Mounting screw	Screw for mounting to the GOT		
8)	Connector	Connector for connection to the GOT		

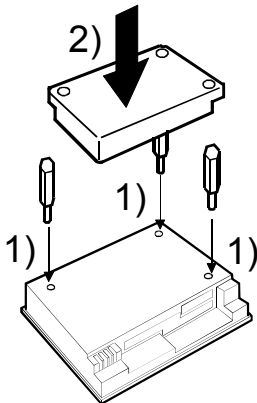
- \*1: Even if the station No. settings are overlapped, the M/S.E. LED may not be on, depending on the line status or cable connection status. It is recommended to confirm the settings by performing a visual check and executing a confirmation test
- \*2: If no terminal resistors are attached, this may be always on. (This is not a network error (specific to A9GT-QJ71BR13.)
- \*3: Make sure to reset the GOT after changing the settings. However, this does not apply when 2) mode setting switch is changed to any of “D” to “F”.

## 4 Installation Procedure

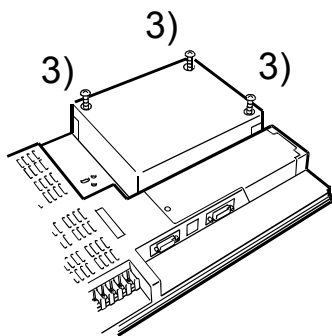
For A985GOT/A97\*GOT/A960GOT



For A95\*GOT/A956WGOT



- 1) Mount the communication unit fixtures (included with GOT) to the GOT, and securely tighten them within the specified torque range. (36 to 48N•cm)  
If a communication board is mounted on the GOT, remove it in advance.
- 2) Mount a network unit onto the GOT interface.



- 3) Securely tighten the mounting screws (3 pcs.) of the network unit within the specified torque range. (36 to 48N•cm)

When removing the unit, loosen the screws first, and then follow the above steps in reverse order.

## 5. Precautions for Laying Cables

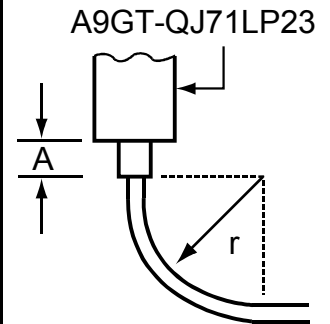
### 5.1 Precautions for cable connection (A9GT-QJ71LP23)

(1) The distance between stations varies with the optical fiber cable used.

Cable Type		Distance between stations
Type SI	Type L	500m (1640 ft.)
	Type H	300m (984 ft.)
Type QSI		1km (3280 ft.)

(2) Optical fiber cables have the following restrictions on the bending radius.

Cable Type		Allowable bending Radius r [mm](in.)	Connector A[mm] (in.)	
			CA9003	CA7003
SI	Standard cable for indoor cabling	50 (1.97)	45 (1.77)	
	Reinforced cable for indoor cabling	85 (3.35)		
	Standard cable for outdoor cabling	85 (3.35)		
	Reinforced cable for outdoor cabling	140 (5.51)		
QSI	Cable for indoor cabling	50 (1.97)		30 (1.18)
	Reinforced cable for indoor cabling	60 (2.36)		
	Reinforced cable for outdoor cabling	60 (2.36)		
	Connectric cable for outdoor cabling	140 (5.51)		



(3) When laying optical fiber cables, do not touch the optical fiber core of the cable connector or unit connector, and make sure that foreign matters such as dust will not stick to it.

Failure to do so may substantially increase the transmission loss, resulting in data link error.

(4) Make sure to directly hold the connector by hand when connecting/disconnecting an optical fiber cable to/from the A9GT-QJ71LP23.

## 5.2 Precautions for cable connection (A9GT-QJ71BR13)

### (1) Restrictions on the cable length between stations

#### (a) Select the cable by referring to the following table.

Failure to do so may cause a communication error.

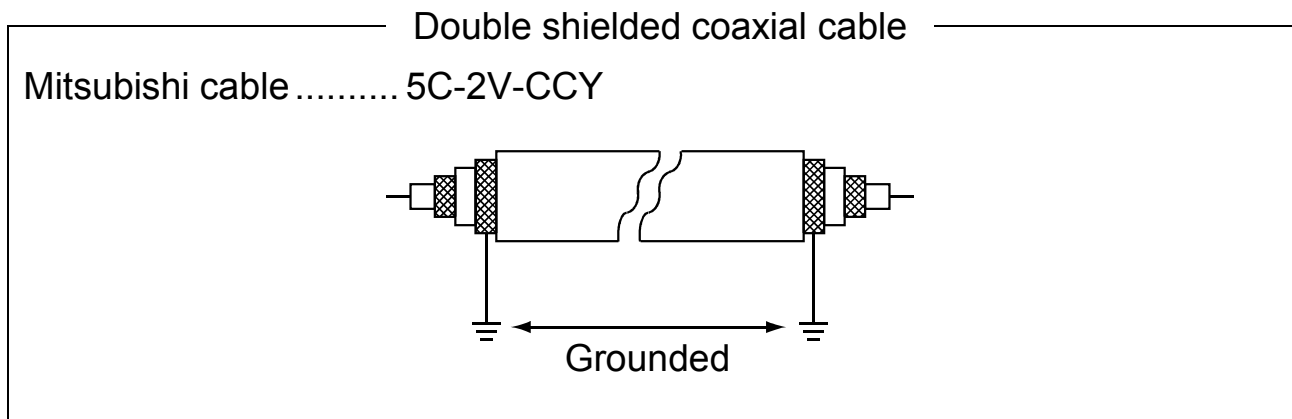
Total Number of Stations	Cable length between stations [m] (ft.)	Overall length
1 to 9 stations	1 to 300m (3.3 to 984) (3C-2V)	300m (984) (3C-2V)
	1 to 500m (3.3 to 1640) (5C-2V)	
10 to 32 stations	1 to 5m (3.3 to 16.4) (3C-2V, 5C-2V)	500M (1640) (5C-2V)
	13 to 17m (42.7 to 55.8) (3C-2V, 5C-2V)	
	25 to 300m (82.0 to 984) (3C-2V)	
	25 to 500m (2.0 to 1640) (5C-2V)	

(b) If the number of connected stations may be increased in future due to system expansion, connect cables considering the relevant restrictions in advance.

### (2) Precautions for laying cable

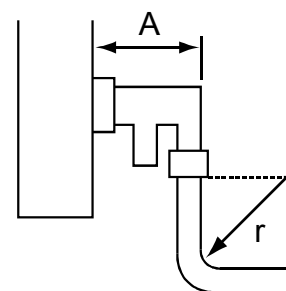
(a) Coaxial cables must be laid 100mm or more apart from power cables and control cables.

(b) Use of the double shielded coaxial cable is recommended for the environment in which excessive noise is generated.



(3) Double shielded coaxial cables have the following restrictions on the bending radius.

Cable type	Allowable bending radius r [mm](in.)	Connector A[mm]
3C-2V	23 (0.91)	50 (1.97)
5C-2V	30 (1.18)	



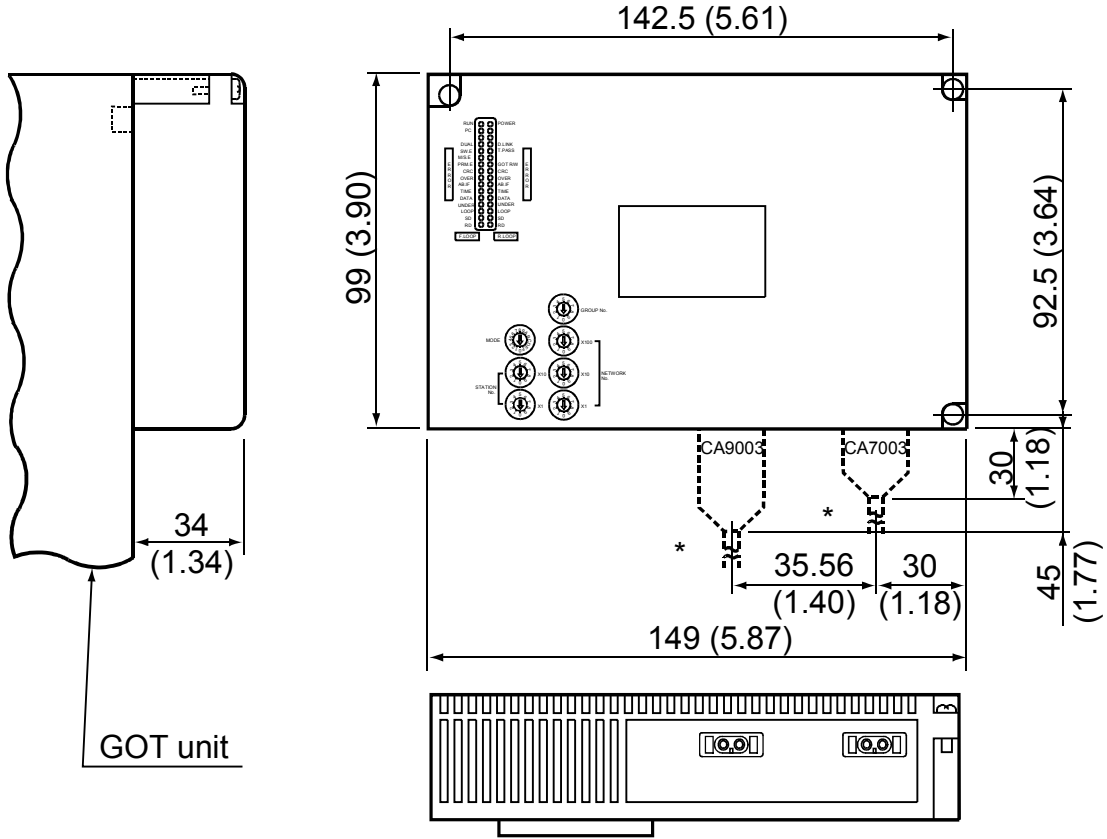
(4) Make sure not to pull the connected cables.

This may cause poor connection and cable disconnection.

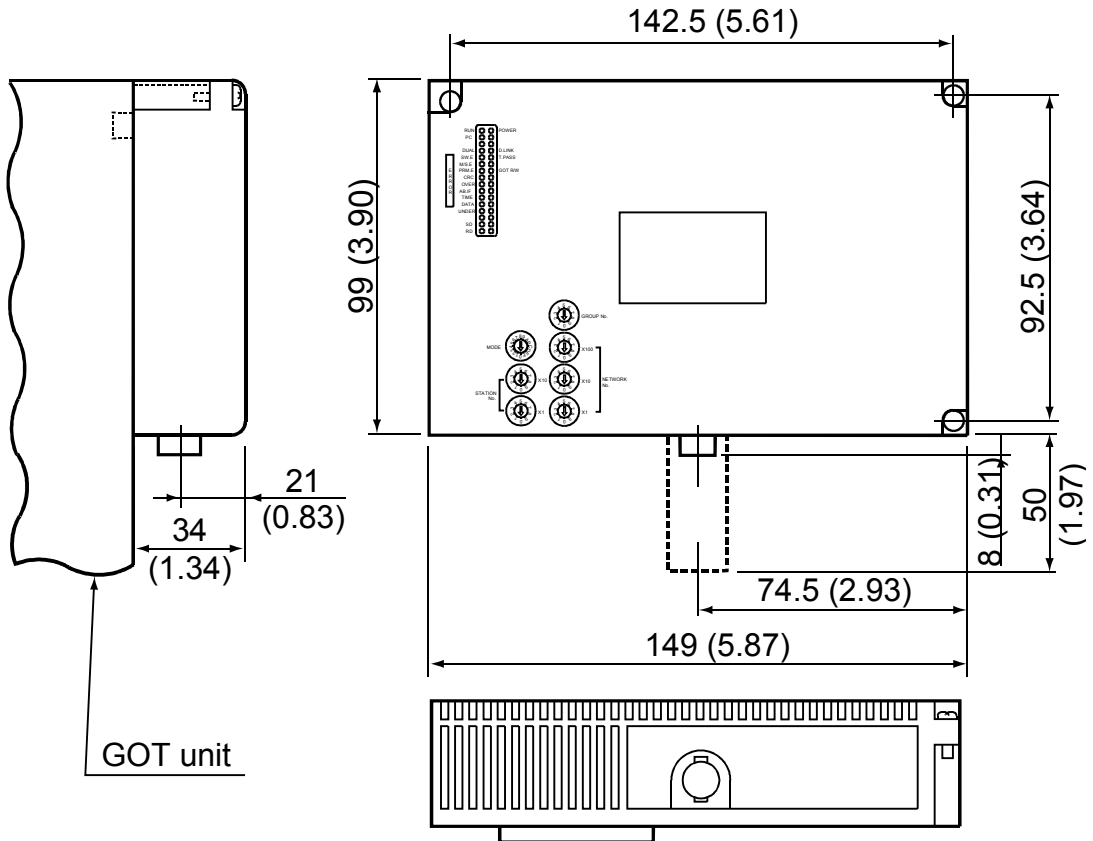
(5) Terminal resistances (A6RCON-R75 or BNC-TMP-05 (75) (HIROSE ELECTRIC CO., LTD.) must be attached to both ends of the system. Please purchase them as they are not included in the product.

## 6. External Dimensions

(1) A9GT-QJ71LP23



(2) A9GT-QJ71BR13



Unit:mm (inch)

## Warranty

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

### ⚠ For safe use

- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi.
- This product has been manufactured under strict quality control. However, when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

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U.S.A	Mitsubishi Electric Automation Inc. 500 Corporate Woods Parkway Vernon Hills, IL 60061 Tel : +1-847-478-2100	Hong Kong	Ryoden Automation Ltd. 10th Floor, Manulife Tower, 169 Electric Road, North Point, HongKong Tel : +852-2887-8870
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