MITSUBISHI

A8GT-50KBF
External I/O Module

Mitsubishi General Purpose PC
User's Manual

Thank you for choosing the Mitsubishi General Purpose PC Graphic Operation Terminal 800 series. To ensure correct use of this equipment, please read this manual carefully before operating it.

GOT
MELSEC

MODEL	A8GT-50KBF-U-E
MODEL CODE	13JL28

IB-NA-66787-A (9707)MEE

When exported from Japan, this manual does not require application to the Ministry of International Trade and Industry for service transaction permission.

•SAFETY PRECAUTIONS•
(Read these precautions before using.)

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

These precautions apply only to Mitsubishi equipment.   Refer to the CPU module user's manual for a description of the PC system safety precautions.

These •SAFETY PRECAUTIONS• classify the safety precautions into two categories: "DANGER" and "CAUTION".

◇DANGER	**Procedures which may lead to a dangerous condition and cause death or serious injury if not carried out properly.**
⚠ CAUTION	**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

- Some faults of the GOT, this unit or connection cables may keep the outputs on or off.
An external monitoring circuit should therefore be provided to check for output signals which may lead to a serious accident.
Otherwise, mis-output or misoperation can cause an accident.

[INSTALLATION PRECAUTIONS]

◇ DANGER

- When installing and removing this module from the GOT main module be sure to shut off the power at all external switches. If all the switches are not turned off, the module could be damaged or malfunction.

- When connecting the bus connection cable to this module be sure to turn off the switch to all external power switches to the GOT and PC CPU. If all the switches are not turned off, it may cause malfunction.

⚠ CAUTION

- Use this module in an environment that is within the general specifications written in the GOT User's Manual. If the power supply is used in an environment that is outside of the general specifications then electric shock, fire, malfunction, or product damage or degradation could occur.

- For a correct installation, insert the bus connection cable to this module, A7GT-BUS2S, bus connector conversion module, and base unit connector until you hear it click.
  A bad connection could cause erroneous input or output.

- When installing this module in the GOT main module, install it in the GOT installation area and be sure it is fastened with a module fastening screw that is tightened within the specified torque range.
  If the module fixing screws are loosen, it may cause malfunction, damage or falling of the module.
  If the module fixing screws are too tight, the GOT main module or the screws could break.

[Wiring Instructions]

◇ DANGER

- Before starting wiring, always switch off all phases of the power supply externally.

⚠ CAUTION

- During wiring, care should be taken so that foreign matter such as shield and wire offcuts do not enter this unit.
  Otherwise, a fire, fault or misoperation can occur.

[WIRNG INSTRUCTIONS]

⚠ **CAUTION**
● The communication and power cables connected to the module must be fixed securely, e.g. contained in ducts or clamped. A failure to do so could cause the cables to dangle, move, or be carelessly pulled, leading to a damaged module or cable or a malfunction due to a cable connection fault.

[STARTING AND MAINTENANCE PRECAUTIONS]

◇ **DANGER**
● While power is on, do not touch the terminals.Otherwise, an electric shock or malfunction could occur.
● Before starting cleaning or terminal screw retightening, always switch off external GOT power in all phases. A failure to do so could cause an electric shock. Undertightening could cause the module to drop, short-circuit or malfunction. Overtightening could cause the module to drop, short-circuit or malfunction

⚠ **CAUTION**
● Do not disassemble or modify this module. Otherwise, a failure, malfunction, injury or fire could occur.
● Do not touch the conducive and electronic parts of this module directly. Otherwise, the module could malfunction or fail.
● This module is made of resin. Do not drop it or subject it to hard impact. This may cause the module to fail.
● When disconnecting the communication or power cable from the module, do not hold and pull the cable part. When disconnecting the cable having a connector, hold the connector plugged in the module. Before disconnecting the cable having no connector, loosen the screws in the module. If the cable connected to the module is pulled, the module or cable may be damaged or a malfunction may occur due to a cable connection fault.

[DISPOSAL PRECAUTIONS]

⚠ **CAUTION**
● When disposing of this product, treat it as industrial waste.

Revisions

© 1997 Mitsubishi Electric Corporation

About This Manual

The following product manuals are available. Please use this table as a reference to request the appropriate manual as necessary.

Detailed Manual

Manual Name	Manual No. (Type Code)
A850GOT Graphic Operation Terminal User's Manual (Packaged with the A850GOT)	IB-66669 (13J847)
A852GOT Graphic Operation Terminal User's Manual (Packaged with the A852GOT)	IB-66767 (13JL15)
A853GOT Graphic Operation Terminal User's Manual (Packaged with the A853GOT)	IB-66785 (13JL26)
Compact Building Block Type I/O Module User's Manual (Optional)	IB-66541 (13JE81)
Building Block Type I/O Module User's Manual (Optional)	IB-66140 (13J643)
GOT Upgrade Additional Manual (Packaged with the Software Package Product Packing)	IB-66744 (13J888)

Table of Contents

1   Overview

This user's manual gives the specifications, system configurations, parts identification, installation procedure and outline dimensions of the A8GT-50KBF type external I/O unit (referred to as the external I/O unit).

The external I/O unit is fitted to the A85☐GOT type graphic operation terminal (referred to as the GOT) to receive up to 8/64 points of inputs and provide up to 16 points of outputs.

GOT

Operator panel,pushbuttons

External I/O unit

Terminal block conversion unit

LAMP

16 points such as lamps and relays

DC power supply 12/24V
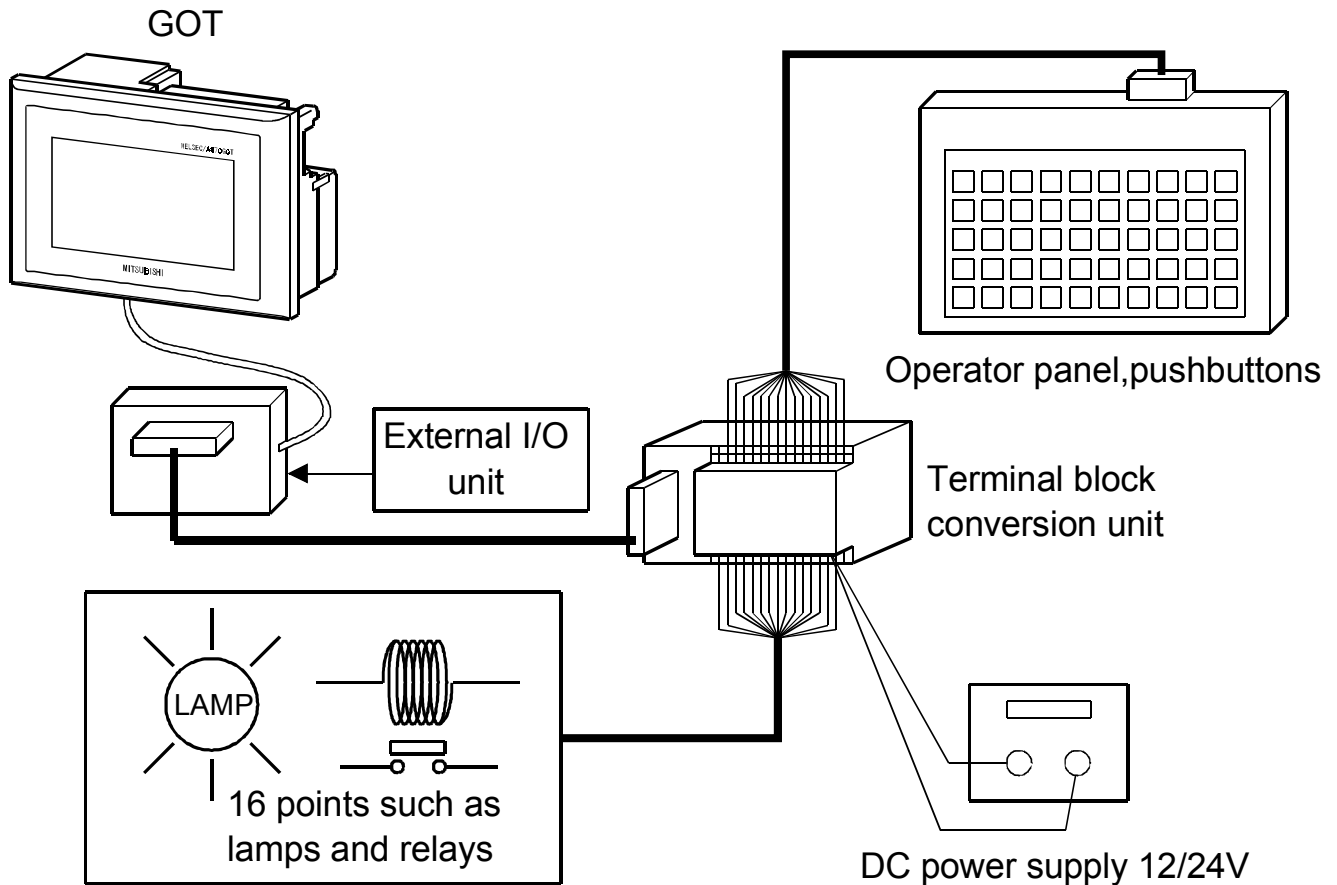
Note: This unit is used with the following versions of software:
SW2NIW-A8GOTP, SW2NIW-A8SYSP; version J or later
.

2   Accessories

After opening the container, check that the following products are present.

Description	Quantity
External I/O unit	1
External connector (soldered type)	1
This manual	1

3   Specifications

Input Specifications		
Input system	Dynamic scan	
Number of input points	8/64 points	
Isolation system	Photocoupler isolation	
Rated input voltage	12VDC	24DVC
Rated input current	Approx. 4mA	Approx. 9mA
Operating voltage range	10.2 to 26.4VDC (ripple percentage within 5%)	
Max. number of simultaneous input points	100% simultaneous ON (at 26.4VDC)	
ON voltage/ON current	8VDC or more/2mA or more	
OFF voltage/OFF current	4VDC or less/1mA or less	
Input resistance	Approx. 2.4K•	
Response time *1 — ON to OFF	Approx. 0.4ms or less (24VDC)	
Response time *1 — OFF to ON	Approx. 0.4ms or less (24VDC)	
Dynamic scan cycle	13.3ms	

.

Output Specifications	
Output system	Direct
Number of output points	16 points
Isolation system	Photocoupler isolation
Rated load voltage	12/24DVC
Max. load current*2	0.1A/1 point
Operating load voltage range	10.2 to 26.4VDC (ripple percentage within 5%)
Max. inrush current	0.4A
Leakage current at OFF	0.1mA or less
Max. voltage drop at ON	2.5VDC (0.1A)
Response time*1 — ON to OFF	2ms or less
Response time*1 — OFF to ON	2ms or less (resistive load)
Surge suppressor	Clamp diode

I/O Specifications	
External connection system	40-pin connector
Applicable wire size	0.3mm^2
Operation indicator	None
External supply power — Voltage*3	12/24VDC (10.2 to 26.4V, ripple percentage 5% or less)
External supply power — Current	1.65A for external output 0.05A for internal consumption only
Fuse rating*4	2A fuse, unreplaceable
Internal current consumption	0.10A
Weight	250g(0.55lb)
Accessory	1 piece of external wiring connector (soldered type)

＊1: Time in the I/O section.

＊2: The maximum load current varies with the number of simultaneous ON points. Refer to the following information:

Relationships between output load current (common current), number of simultan-eous ON points and ambient temperature

0.1A~ 16points
1.6A

0.08A~ 16points
1.28A

Common current

Ambient temperature   51•   55•
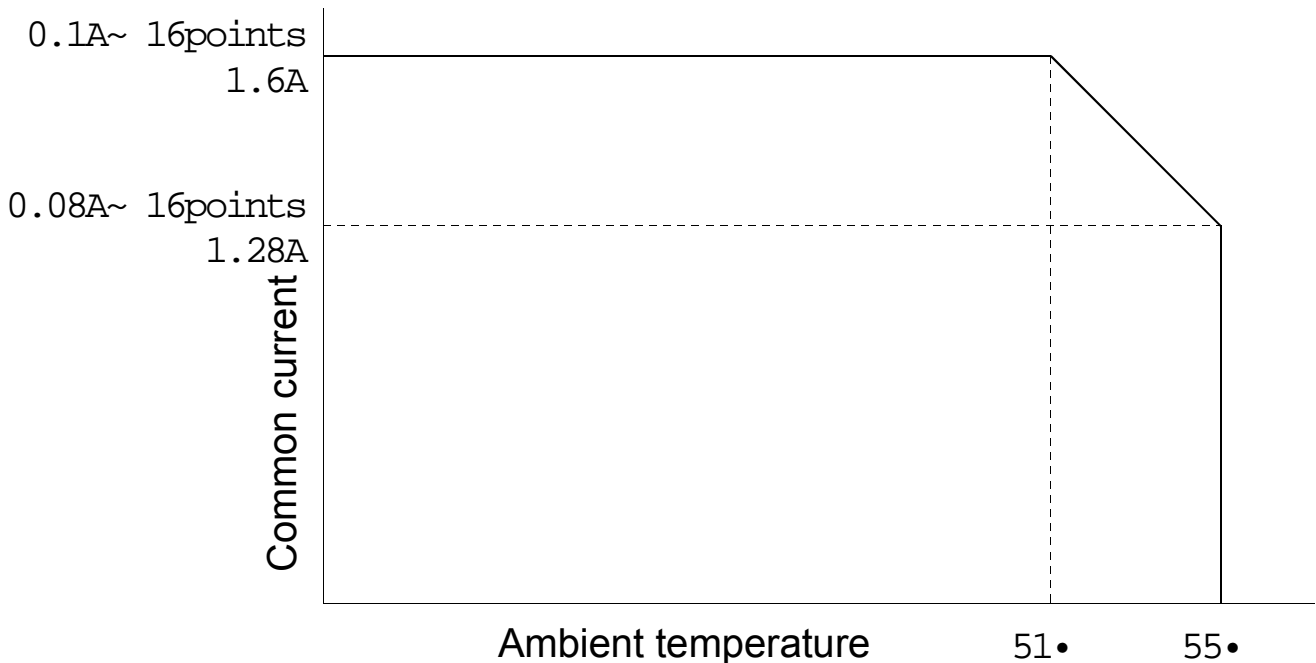
＊3: A fuse-blown error will also be displayed when the external supply power switches off.

＊4: The fuse in the output unit is provided to prevent the external wiring from burning out if the outputs of the unit are shorted.
Therefore, it may not protect the output elements.
The fuse may not be blown if the output elements are damaged in the fault mode other than a short circuit.

External Connector Pin-Outs

View from the unit front   Connector used: Fujitsu's FCN-364P040-AU

B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12 B13 B14 B15 B16 B17 B18 B19 B20
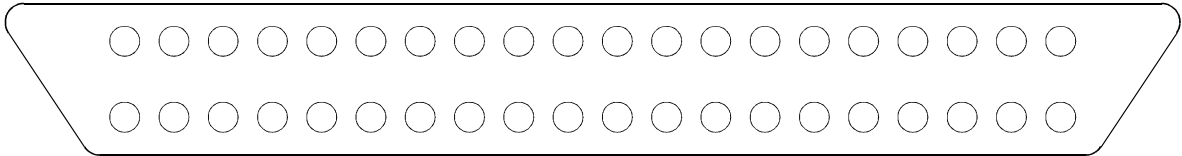
A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15 A16 A17 A18 A19 A20

Pin Numbers and Signal Names of External Connector

Pin Number	Signal Name	Pin Number	Signal Name
1A	XD7	1B	XD6
2A	XD5	2B	XD4
3A	XD3	3B	XD2
4A	XD1	4B	XD0
5A	XSCN7	5B	XSCN8
6A	XSCN5	6B	XSCN4
7A	XSCN3	7B	XSCN2
8A	XSCN1	8B	XSCN0
9A	YDF	9B	YDE
10A	YDD	10B	YDC
11A	YDB	11B	YDA
12A	YD9	12B	YD8
13A	YD7	13B	YD6
14A	YD5	14B	YD4
15A	YD3	15B	YD2
16A	YD1	16B	YD0
17A	HOT24/12	17B	HOT24/12
18A	HOT24/12	18B	RTN24/12
19A	RTN24/12	19B	
20A		20B	FG

External Connection Diagram (1) (8-point inputs, 16-point outputs)

Pin number

Pin	Signal
4B	XD0
4A	XD1
3B	XD2
3A	XD3
2B	XD4
2A	XD5
1B	XD6
1A	XD7
8B	XSCN0
8A	XSCN1
7B	XSCN2
7A	XSCN3
6B	XSCN4
6A	XSCN5
5B	XSCN6
5A	XSCN7
16B	YD0
16A	YD1
15B	YD2
15A	YD3
14B	YD4
14A	YD5
13B	YD6
13A	YD7
12B	YD8
12A	YD9
11B	YDA
11A	YDB
10B	YDC
10A	YDD
9B	YDE
9A	YDF

Internal control circuit

Internal control circuit

Internal scan is made at 1/8 duty.

Internal control circuit

R

L

L

17A,17B,18A

18B,19A

DC12/24V

Fuse-blown detector circuit

*1: A fuse-blown error will also be displayed when the external supply power switches off.

*2: The fuse in the output unit is provided to prevent the external wiring from burning out if the outputs of the unit are shorted.

Therefore, it may not protect the output elements.

The fuse may not be blown if the output elements are damaged in the fault mode other than a short circuit.

External Connection Diagram (2) (64-point inputs, 16-point outputs)

Pin number

Input terminals

38	30	28	20	18	10	08	00	4B	XD0
39	31	29	21	19	11	09	01	4A	XD1
3A	32	2A	22	1A	12	0A	02	3B	XD2
3B	33	2B	23	1B	13	0B	03	3A	XD3
3C	34	2C	24	1C	14	0C	04	2B	XD4
3D	35	2D	25	1D	15	0D	05	2A	XD5
3E	38	2E	28	1E	16	0E	08	1B	XD6
3F	37	2F	27	1F	17	0F	07	1A	XD7

8B	XSCN0
8A	XSCN1
7B	XSCN2
7A	XSCN3
6B	XSCN4
6A	XSCN5
5B	XSCN6
5A	XSCN7

Internal control circuit

Internal control circuit

Internal scan is made at 1/8 duty.

16B	YD0
16A	YD1
15B	YD2
15A	YD3
14B	YD4
14A	YD5
13B	YD6
13A	YD7
12B	YD8
12A	YD9
11B	YDA
11A	YDB
10B	YDC
10A	YDD
9B	YDE
9A	YDF

Internal control circuit

17A,17B,18A

18B,19A

DC12/24V

Fuse-blown detector circuit

*1: When there is a probability that two or more switches are pressed simultaneously, each switch must be provided with a diode. (Refer to the right figure.)
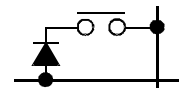
*2: A fuse-blown error will also be displayed when the external supply power switches off.

*3: The fuse in the output unit is provided to prevent the external wiring from burning out if the outputs of the unit are shorted. Therefore, it may not protect the output elements. The fuse may not be blown if the output elements are damaged in the fault mode other than a short circuit.

6

4 System Configuration

The system configuration depends on whether the external I/O unit provides outputs or not.

4.1 System Configuration for No Outputs

Connection cable	Inputs (Originaloperator panel)
DC power supply 12/24V	
User-fabricated	User-fabricated

External I/O unit	GOT
A8GT-50KBF	A85 GOT
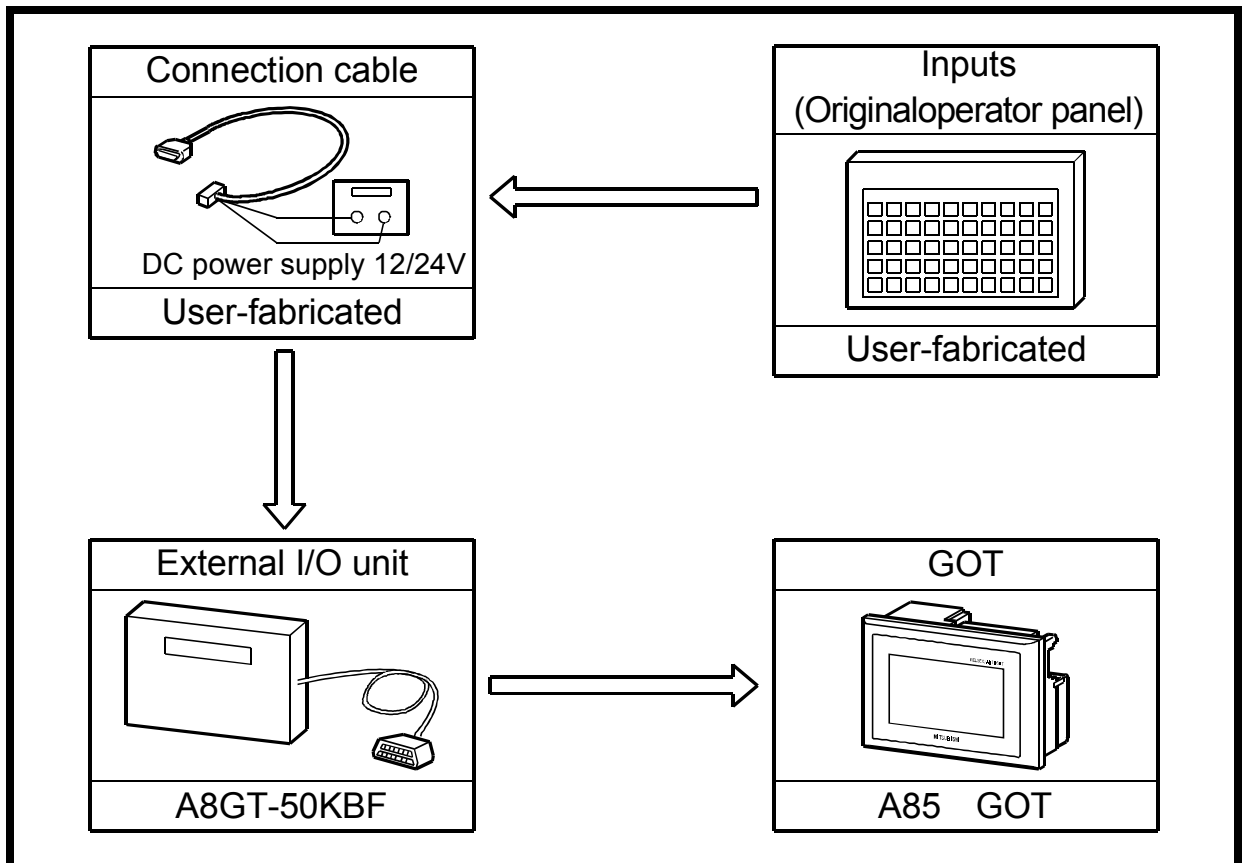
4.2   System Configuration for Outputs

4.2.1 System configuration

(1) For 8-point inputs
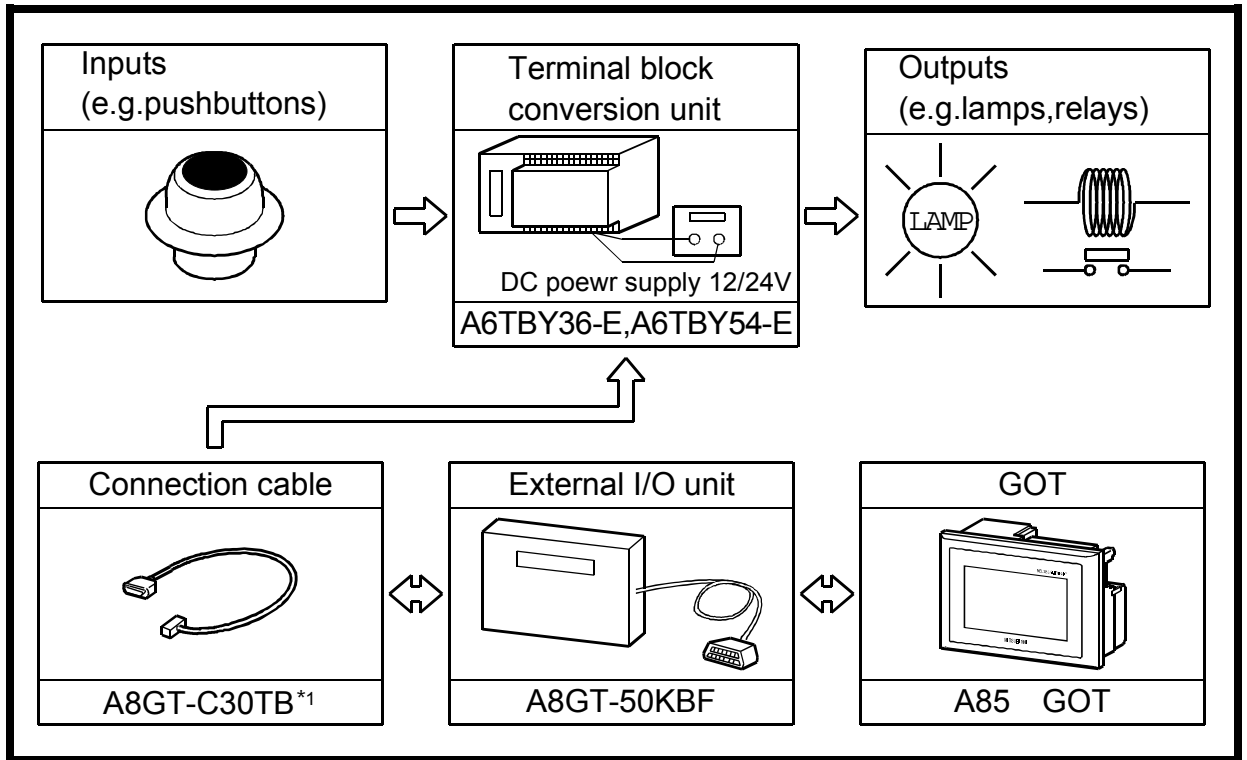
•1 The cable for connection between external I/O unit and terminal block
   conversion unit may also be fabricated by the user.

(2) For 64-point inputs
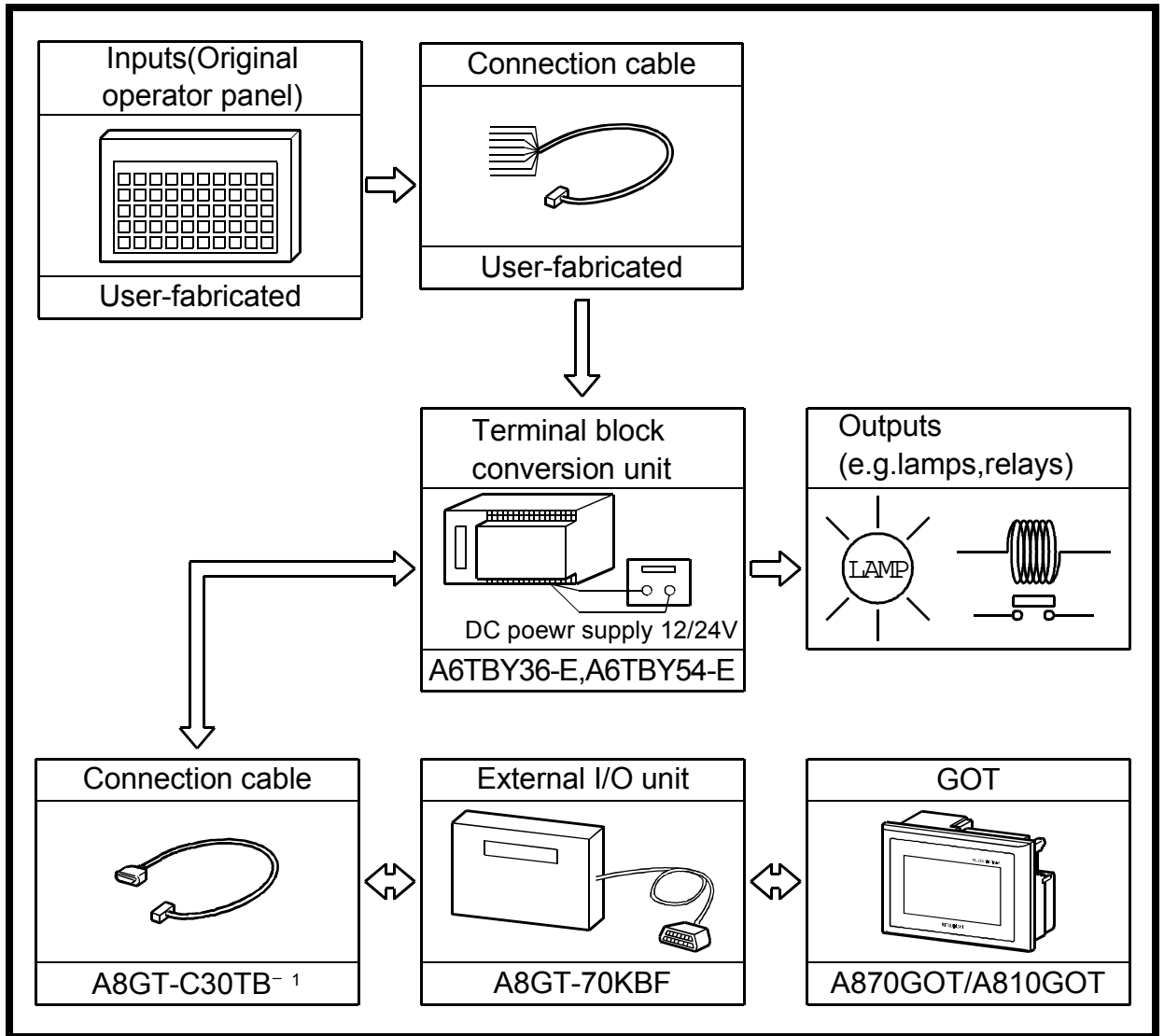
Inputs(Original operator panel)	Connection cable
User-fabricated	User-fabricated

Terminal block conversion unit

DC poewr supply 12/24V

A6TBY36-E,A6TBY54-E

Outputs (e.g.lamps,relays)

LAMP

Connection cable	External I/O unit	GOT
A8GT-C30TB⁻ 1	A8GT-70KBF	A870GOT/A810GOT

•1 The cable for connection between external I/O unit and terminal block conversion unit may also be fabricated by the user.

9

4.2.2 Connection between the external I/O unit and terminal block conversion unit

(1) For use of the terminal block conversion unit (A6TBY36-E)

A8GT-50KBF

Cable for connection between external I/O unit and terminal block conversion unit

Shield

A6TBY36-E

Terminal	Signal		Terminal
4B	XD0		B20
4A	XD1		A20
3B	XD2		B19
3A	XD3		A19
2B	XD4		B18
2A	XD5		A18
1B	XD6		B17
1A	XD7		A17
8B	XSCN0		B16
8A	XSCN1		A16
7B	XSCN2		B15
7A	XSCN3		A15
6B	XSCN4		B14
6A	XSCN5		A14
5B	XSCN6		B13
5A	XSCN7		A13
16B	YD0		B12
16A	YD1		A12
15B	YD2		B11
15A	YD3		A11
14B	YD4		B10
14A	YD5		A10
13B	YD6		B9
13A	YD7		A9
12B	YD8		B8
12A	YD9		A8
11B	YD10		B7
11A	YD11		A7
10B	YD12		B6
10A	YD13		A6
9B	YD14		B5
9A	YD15		A5
17A	LOT24/12		B4
17B	LOT24/12		A4
18A	LOT24/12		B3
18B	RTN24/12		A3
19A	RTN24/12		B2
19B	Empty		A2
20A	Empty		B1
20B	FG		A1

Top terminals: 0 1 2 3 4 5 6 7 8 9 A B C D E F 24V 0V

Bottom terminals: 10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F 24V 0V

10

(2) For use of the terminal block conversion unit (A6TBY54-E)

Cable for connection
between external
I/O unit and
terminal block
conversion unit

A8GT-50KBF

Shield

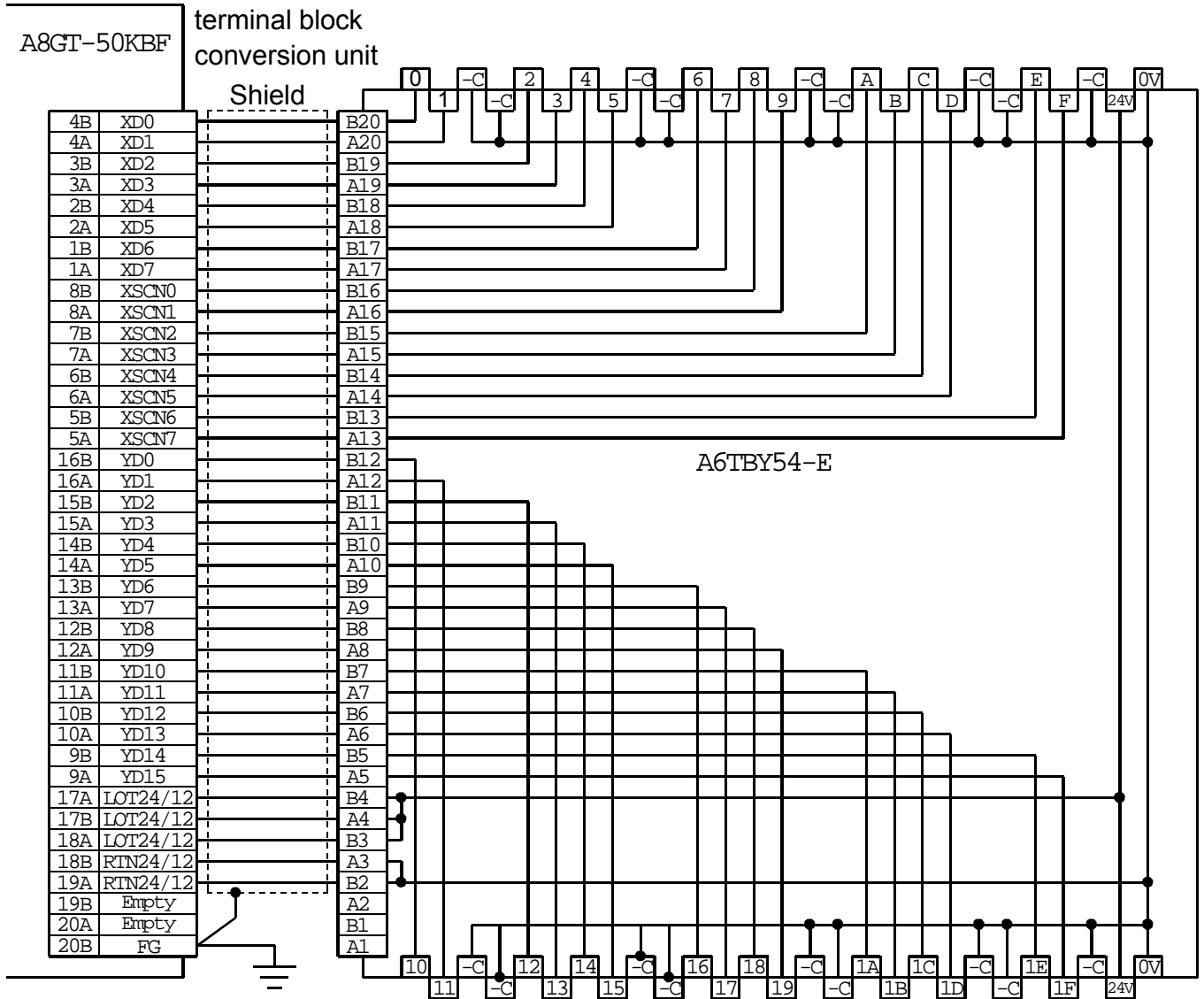|			
4B	XD0		B20
4A	XD1		A20
3B	XD2		B19
3A	XD3		A19
2B	XD4		B18
2A	XD5		A18
1B	XD6		B17
1A	XD7		A17
8B	XSCN0		B16
8A	XSCN1		A16
7B	XSCN2		B15
7A	XSCN3		A15
6B	XSCN4		B14
6A	XSCN5		A14
5B	XSCN6		B13
5A	XSCN7		A13
16B	YD0		B12
16A	YD1		A12
15B	YD2		B11
15A	YD3		A11
14B	YD4		B10
14A	YD5		A10
13B	YD6		B9
13A	YD7		A9
12B	YD8		B8
12A	YD9		A8
11B	YD10		B7
11A	YD11		A7
10B	YD12		B6
10A	YD13		A6
9B	YD14		B5
9A	YD15		A5
17A	LOT24/12		B4
17B	LOT24/12		A4
18A	LOT24/12		B3
18B	RTN24/12		A3
19A	RTN24/12		B2
19B	Empty		A2
20A	Empty		B1
20B	FG		A1

A6TBY54-E

Top row: 0 -C 2 4 -C 6 8 -C A C -C E -C 0V
          1 -C 3 5 -C 7 9 -C B D -C F 24V

Bottom row: 10 -C 12 14 -C 16 18 -C 1A 1C -C 1E -C 0V
             11 -C 13 15 -C 17 19 -C 1B 1D -C 1F 24V

11

4.2.3 Connection of external inputs and external outputs to the terminal block conversion unit.

(1) For use of the terminal block conversion unit (A6TBY36-E)

User-fabricated original operator panel

A6TBY36-E

Loads:Lamps,relays,etc.

DC12/24V
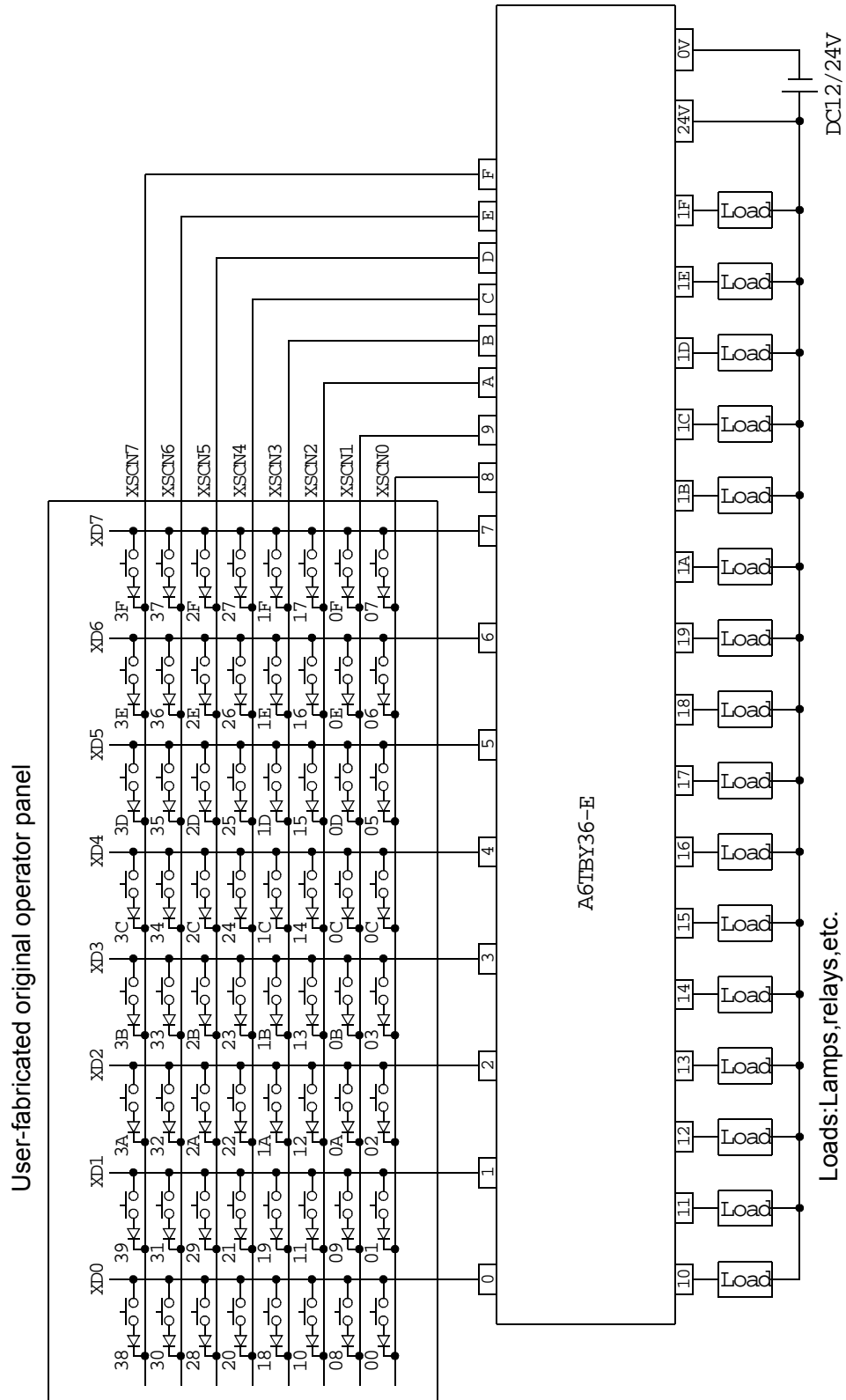
(2) For use of the terminal block conversion unit (A6TBY54-E)

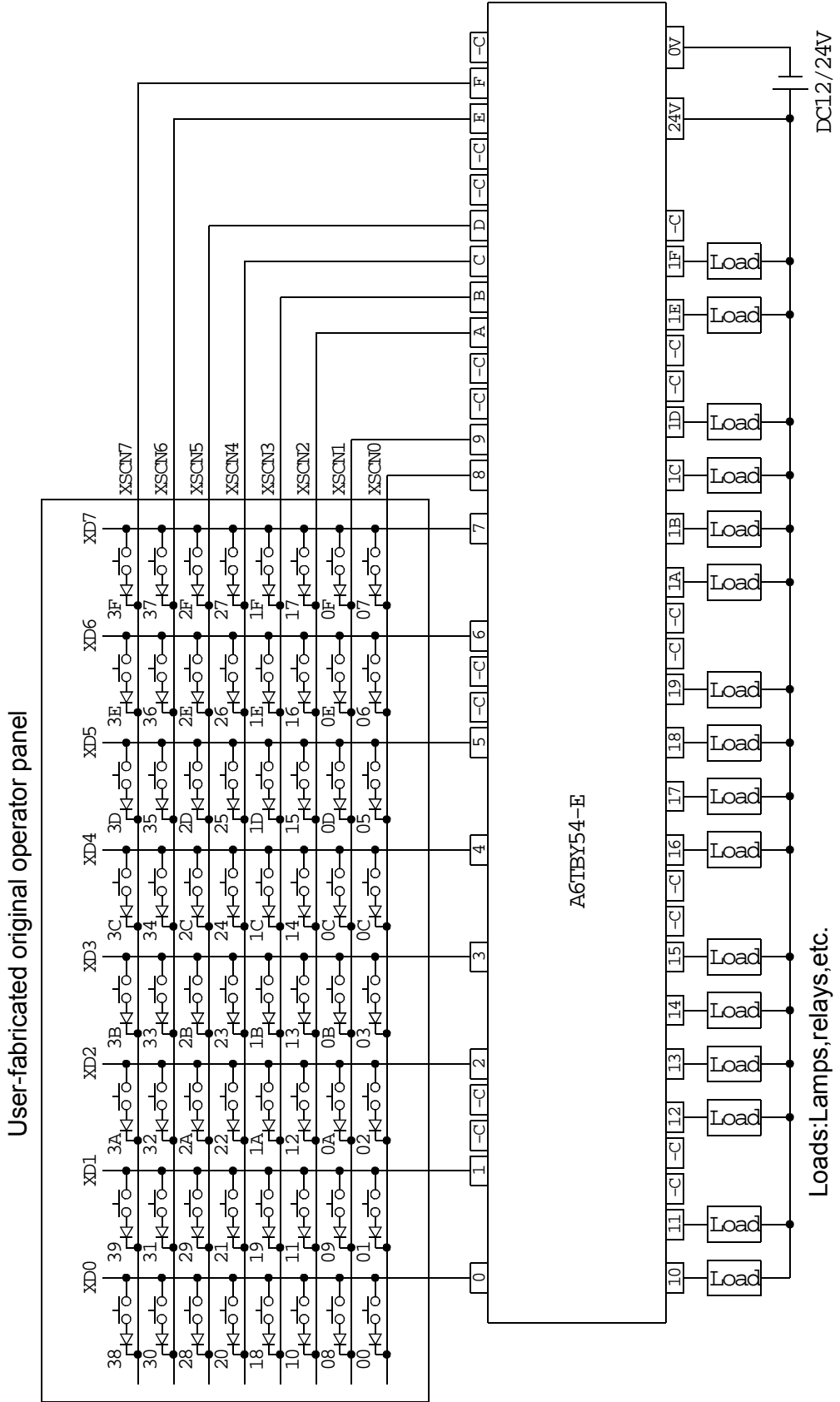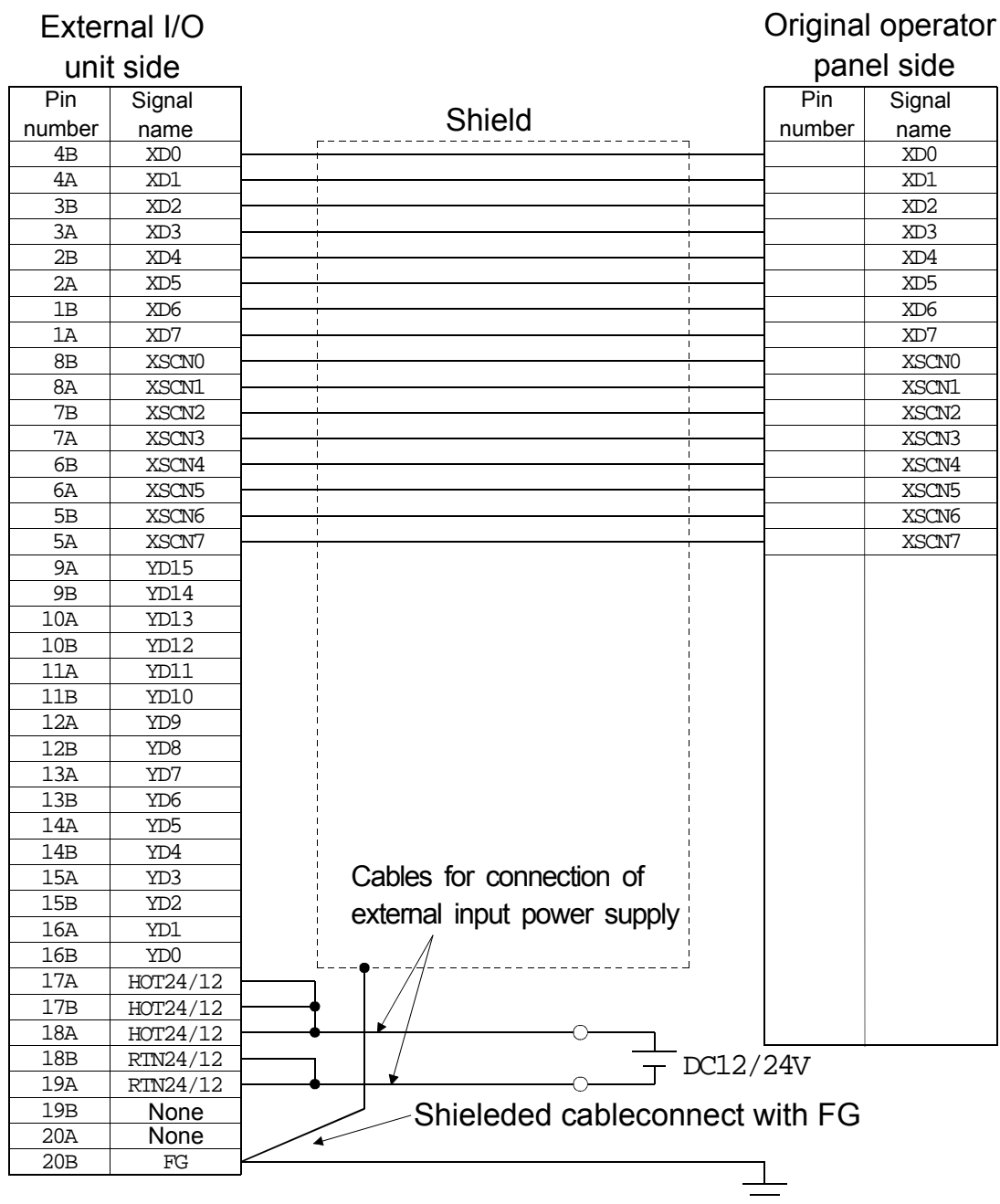# 5. User-fabricated Connection Cables

The following is the way of fabricating the connection cable which can be fabricated by the user.

5.1 Cable for connection between external I/O unit and original operator panel

Fabricate the connection cable in accordance with the following wiring diagram, parts diagram and assembly drawing.
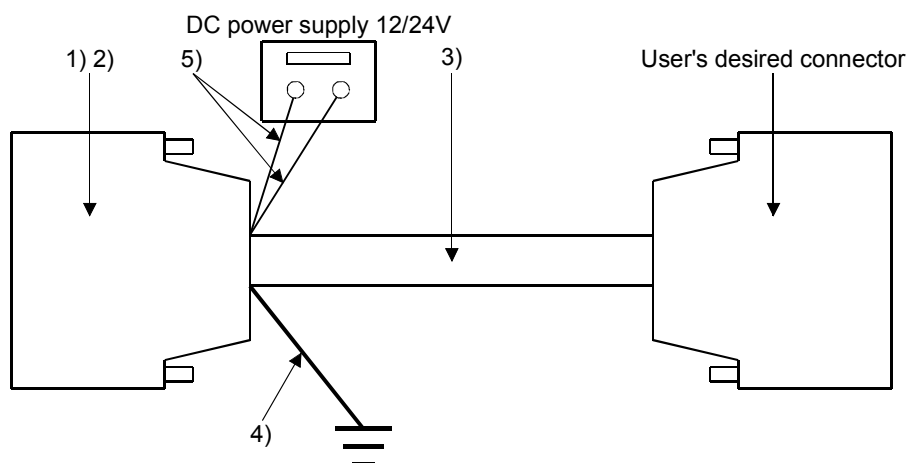(Max cable length:20m(65.62feet))

(1)A wiring diagram

External I/O unit side			Original operator panel side	
Pin number	Signal name	Shield	Pin number	Signal name
4B	XD0			XD0
4A	XD1			XD1
3B	XD2			XD2
3A	XD3			XD3
2B	XD4			XD4
2A	XD5			XD5
1B	XD6			XD6
1A	XD7			XD7
8B	XSCN0			XSCN0
8A	XSCN1			XSCN1
7B	XSCN2			XSCN2
7A	XSCN3			XSCN3
6B	XSCN4			XSCN4
6A	XSCN5			XSCN5
5B	XSCN6			XSCN6
5A	XSCN7			XSCN7
9A	YD15			
9B	YD14			
10A	YD13			
10B	YD12			
11A	YD11			
11B	YD10			
12A	YD9			
12B	YD8			
13A	YD7			
13B	YD6			
14A	YD5			
14B	YD4			
15A	YD3			
15B	YD2			
16A	YD1			
16B	YD0			
17A	HOT24/12			
17B	HOT24/12			
18A	HOT24/12			
18B	RTN24/12			
19A	RTN24/12			
19B	None			
20A	None			
20B	FG			

Cables for connection of external input power supply

DC12/24V

Shieleded cableconnect with FG

(2) Parts list

Part number	Name	Type	Quantity	Maker
1)	Connector	FCN-361J040-AU	1	FUJITSU LTD
2)	connector cover	FCN-360C040-B	1	
3)	paired sealed cable	UL 2464 AWG^{2}26×20P	•	Oki Electric Cable Co.,Ltd
4)	FG cable	UL 1015 AWG14 or equivalent	1	•
5)	Cable for connection of external input power supply.	•	2	•

(3) Assembly

DC power supply 12/24V

1) 2)   5)   3)   User's desired connector

4)

POINT

· The grounding wire (green wire, approx.1m) coming out of the connector of the user-fabricated connection cable must be connected to the control box or the like.

· Grounding should be independent where possible.

· Use class 3 grounding method (grounding resistance is 100 • max.).

· The grounding point should be as near as possible to the external I/O module to minimize the grounding cable length.

· Adjust the grounding cable length according to the grounding position and install a terminal or the like for grounding.

· When grounding, always connect the FG cable for connection with the GOT's power supply terminal block and the FG wire of the user-fabricated connection cable separately.
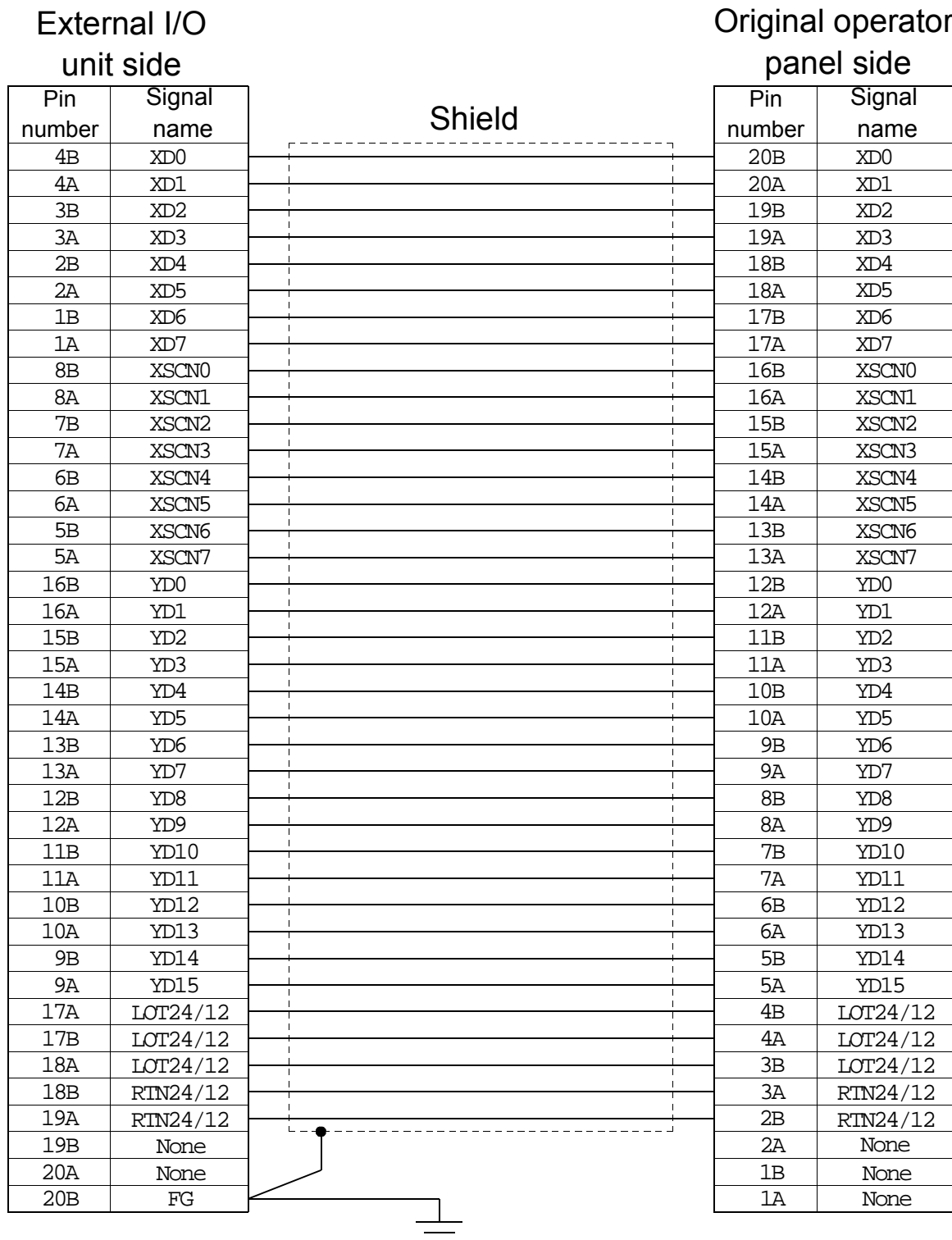
5.2 cable for connection between external I/O unit and terminal block conversion unit.

Fabricate the connection cable in accordance with the following wiring diagram, parts diagram and assembly drawing.
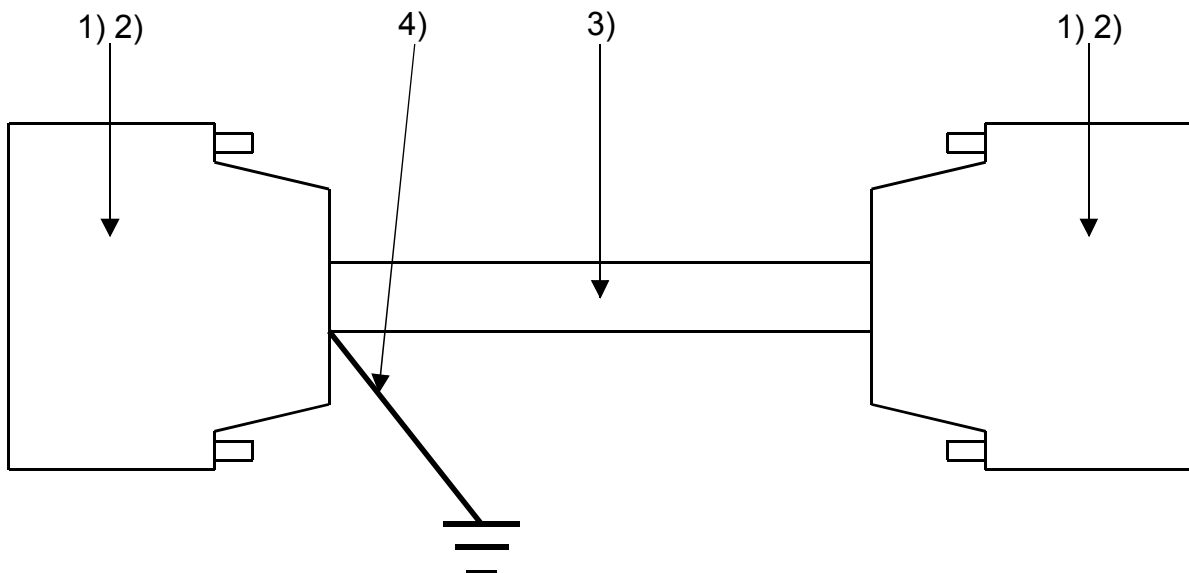
(Max cable length:10m(32.81feet))

(1)A wiring diagram

External I/O unit side   Original operator panel side

Shield

Pin number	Signal name		Pin number	Signal name
4B	XD0		20B	XD0
4A	XD1		20A	XD1
3B	XD2		19B	XD2
3A	XD3		19A	XD3
2B	XD4		18B	XD4
2A	XD5		18A	XD5
1B	XD6		17B	XD6
1A	XD7		17A	XD7
8B	XSCN0		16B	XSCN0
8A	XSCN1		16A	XSCN1
7B	XSCN2		15B	XSCN2
7A	XSCN3		15A	XSCN3
6B	XSCN4		14B	XSCN4
6A	XSCN5		14A	XSCN5
5B	XSCN6		13B	XSCN6
5A	XSCN7		13A	XSCN7
16B	YD0		12B	YD0
16A	YD1		12A	YD1
15B	YD2		11B	YD2
15A	YD3		11A	YD3
14B	YD4		10B	YD4
14A	YD5		10A	YD5
13B	YD6		9B	YD6
13A	YD7		9A	YD7
12B	YD8		8B	YD8
12A	YD9		8A	YD9
11B	YD10		7B	YD10
11A	YD11		7A	YD11
10B	YD12		6B	YD12
10A	YD13		6A	YD13
9B	YD14		5B	YD14
9A	YD15		5A	YD15
17A	LOT24/12		4B	LOT24/12
17B	LOT24/12		4A	LOT24/12
18A	LOT24/12		3B	LOT24/12
18B	RTN24/12		3A	RTN24/12
19A	RTN24/12		2B	RTN24/12
19B	None		2A	None
20A	None		1B	None
20B	FG		1A	None

16

(2) Parts list

| Part number	Name	Type	Quantity	Maker
1)	Connector	FCN-361J040-AU	1	FUJITSU LTD
2)	connector cover	FCN-360C040-B	1	
3)	paired sealed cable	UL 2464 AWG^{2}26×20P	•	Oki Electric Cable Co.,Ltd
4)	FG cable	UL 1015 AWG14 or equivalent	1	•

(3) Assembly

POINT

· The grounding wire (green wire,approx.1m) coming out of the connector of the user-fabricated connection cable must be connected to the control box or the like.

· Grounding should be independent where possible.

· Use class 3 grounding method (grounding resistance is 100•max.).

· The grounding point should be as near as possible to the external I/O module to minimize the grounding cable length.

· Adjust the grounding cable length according to the grounding position and install a terminal or the like for grounding.

· When grounding, always connect the FG cable for connection with the GOT's power supply terminal block and the FG wire of the user-fabricated connection cable separately.

6   Parts Identification
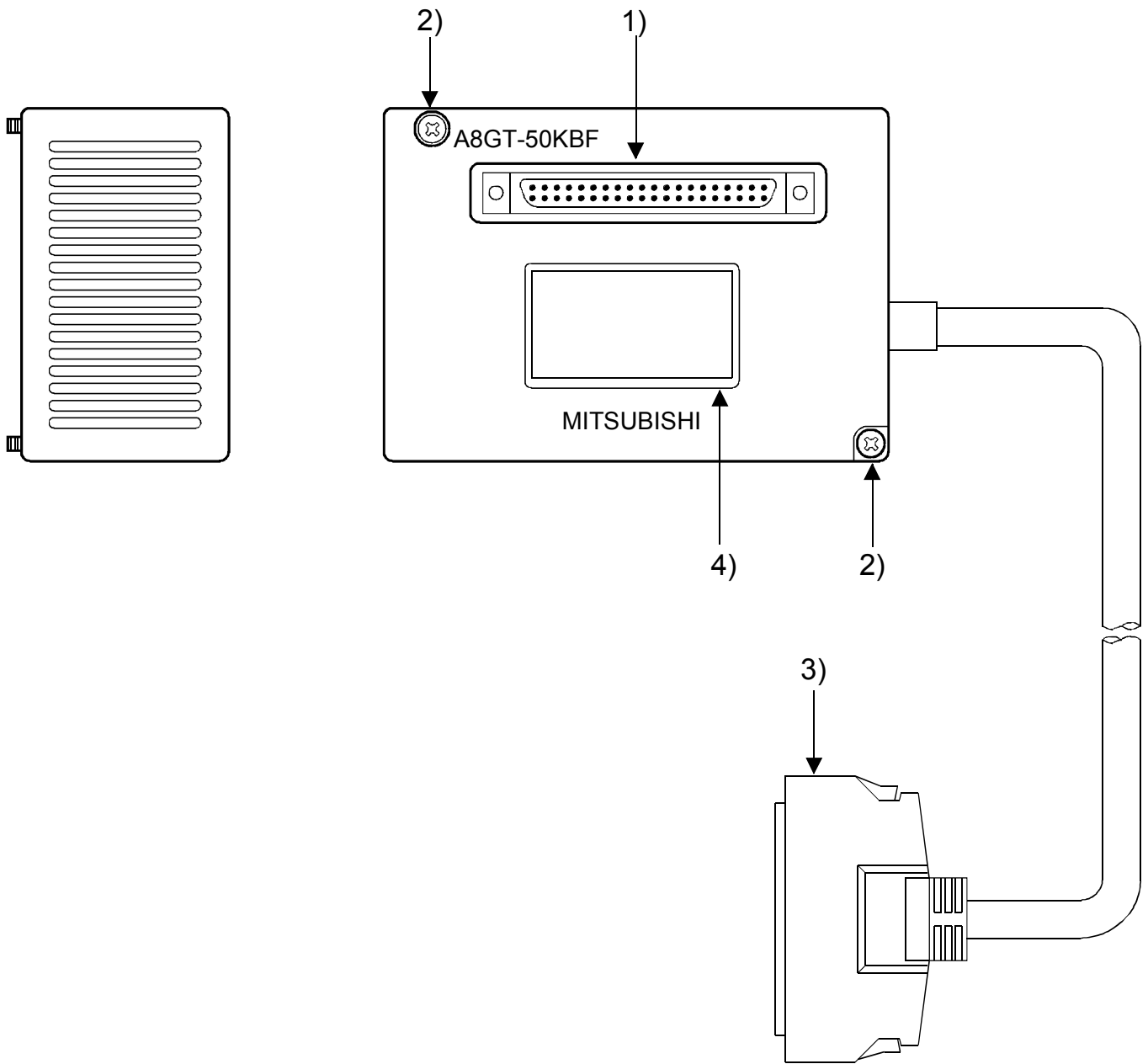
No.	Name	Description
1)	I/O cable connection interface	Interface for connection of the I/O cable
2)	Unit fixing screws	Screws used to fix the unit to the GOT
3)	Connector	Connector used to plug the unit to the GOT.
4)	Rating plate	•

7. Installation Procedure

Mount or dismount the module to or from the GOT in the following

1) Thread external I/O module mounting screw holes in the control box or the like. (2-•3.5 mounting holes)
The external I/O module's GOT connection cable is 50cm long. Install the external I/O module within this distance so that the GOT-end connector of the cable may be fitted into the GOT's connector.
When mounting the external I/O module on the back of the control box door, use care to avoid screw holes passing through the control box surface.

2) Tighten the module fixing screws (2 pcs.) in the specified torque range 39 to 59N·cm (4 to 6kg·cm).

3) Fit the GOT-end connector of the cable into the connector in the GOT outside.
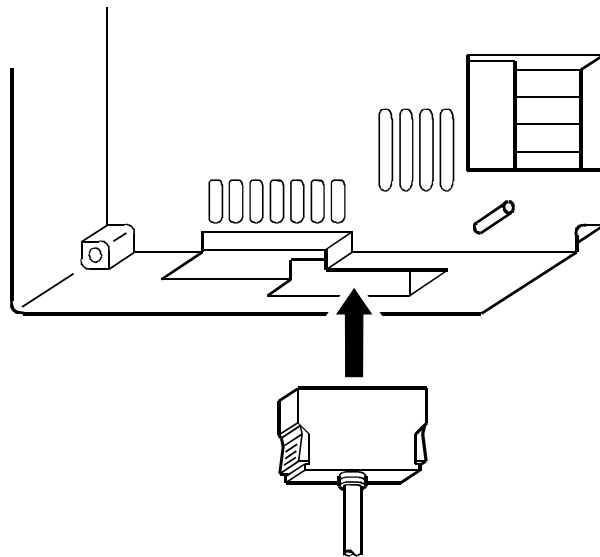
When using the A8GT-50STE option module mounting bracket(referred to as the "STE". For details, see below.) to fit this module to the back of the GOT main unit ,refer to the A8GT-50STE Option Module Mounting Bracket User's Manual.

The STE is a mounting bracket used to install the option module (A8GT-50PRF,A8GT-50KBF) to the A85   GOT main unit.

When using the STE
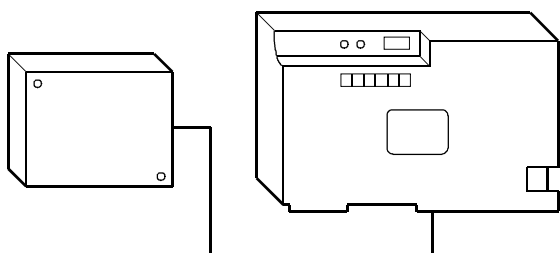
The option module can be fitted to the GOT main unit.

Control box

A8GT-50STE
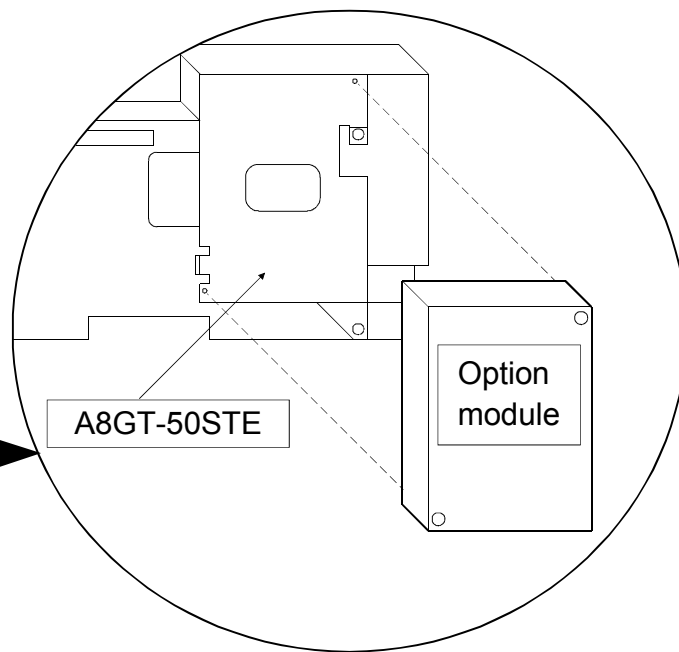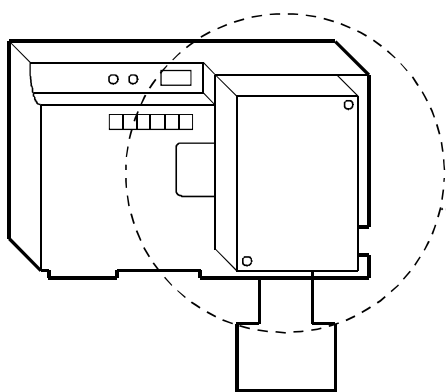
Option module

When not using the STE

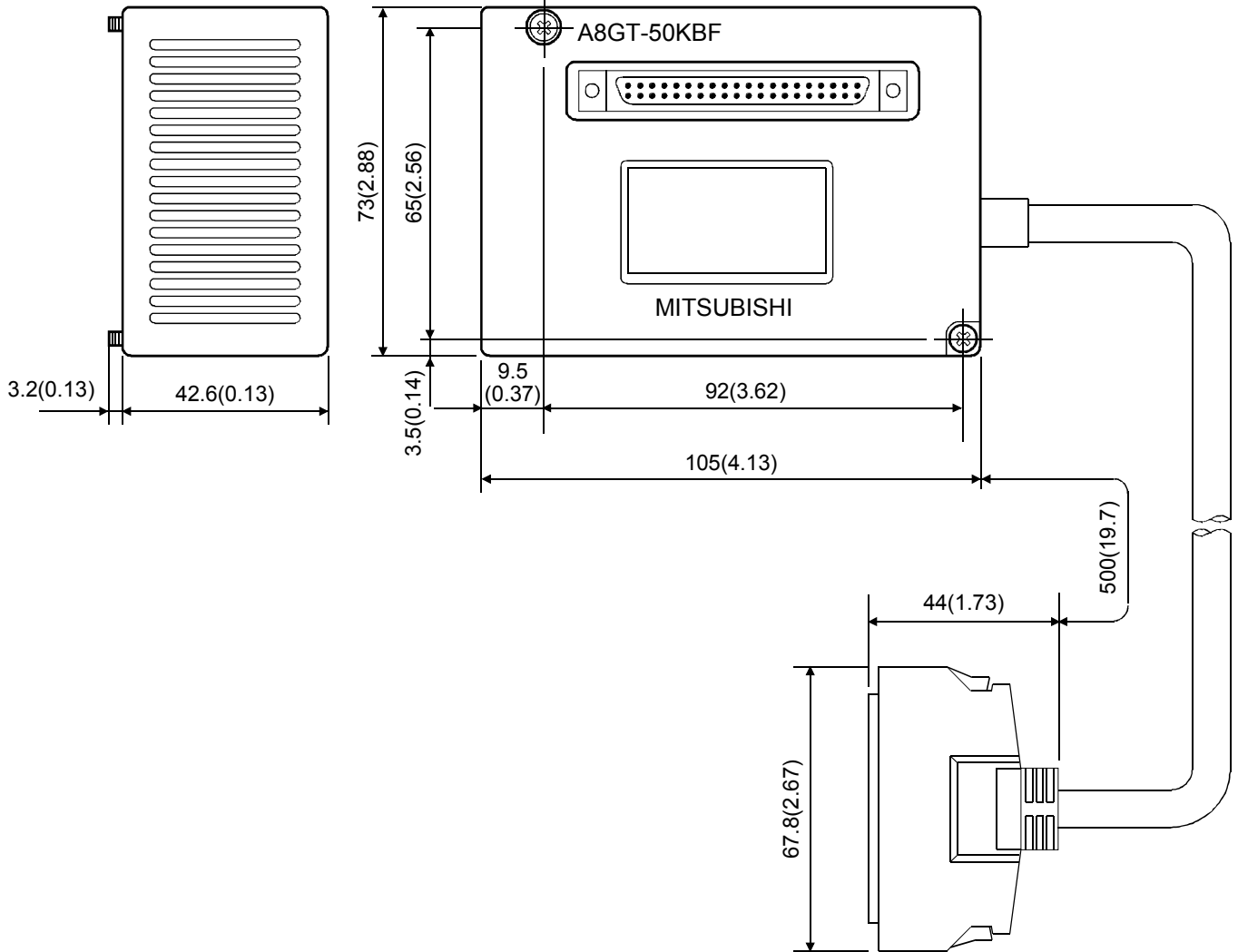As the option module is used on the control box, secure an installation space

Control box

Restrictions on Use of the STE

· The communication module (e.q. A7GT-BUS,A8GT-J61BT15) cannot be fitted to the GOT.
· When performing Operating system installation or monitor data downloading from the DOS/V personal computer to the GOT ,the "25 pins to 9 pins conversion connector" cannot be used on the GOT.
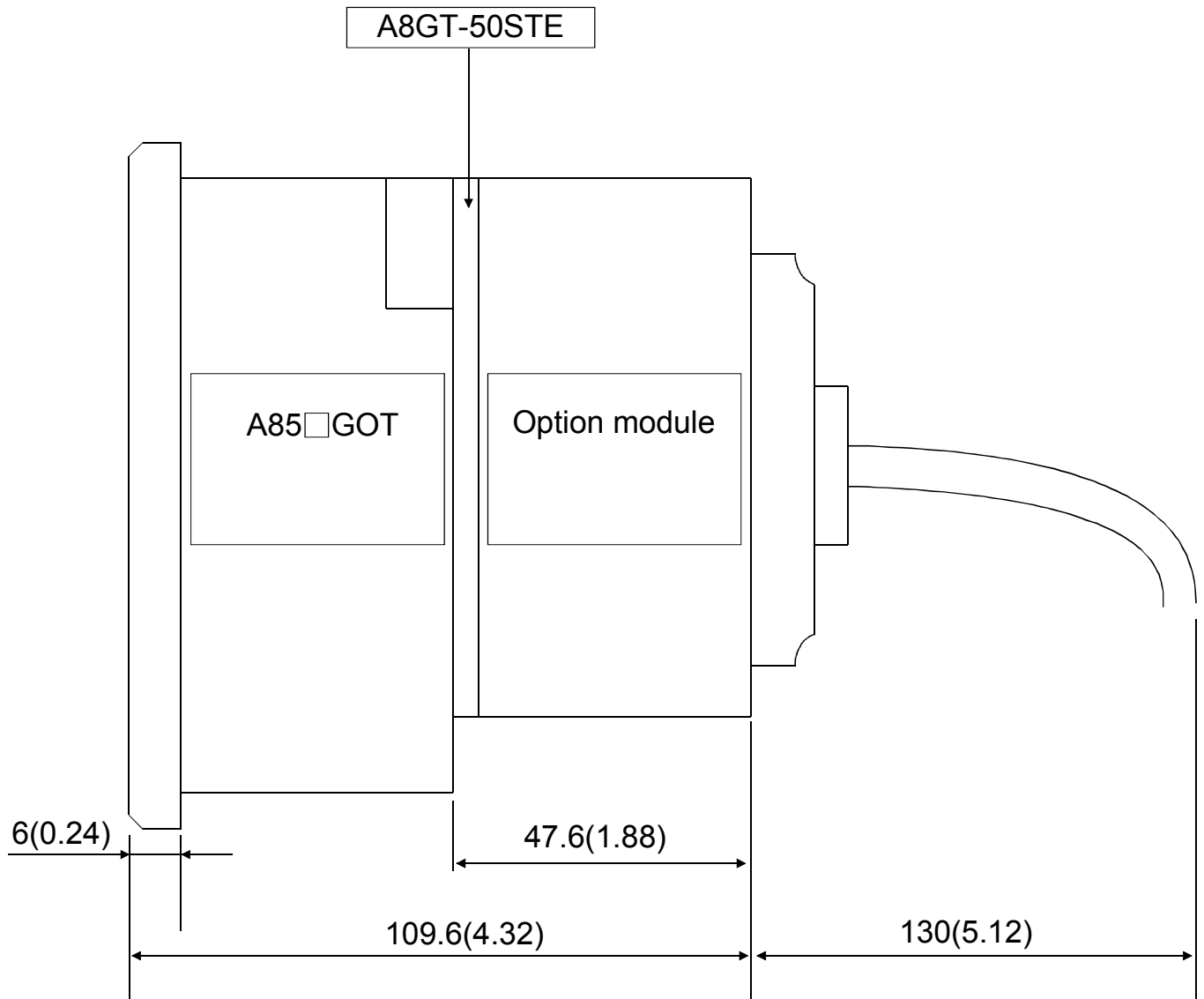
8 Outline Dimension Drawing

Unit:mm(inch)

A8GT-50KBF

MITSUBISHI

73(2.88)

65(2.56)

3.2(0.13)   42.6(0.13)

3.5(0.14)

9.5
(0.37)   92(3.62)

105(4.13)

500(19.7)

44(1.73)

67.8(2.67)

Appendix

Appendix 1   Depth Diagram for Use of the STE

A8GT-50STE

A85□GOT

Option module

6(0.24)

47.6(1.88)

109.6(4.32)

130(5.12)

Unit:mm(inch)