

TECHNICAL BULLETIN

[1 / 14]

[Issue No.] GOT-A-0024-F

[Title] Precautions to Acquire the Type Approval Certificate for the GOT1000 Series

[Date of Issue] May 2009 (Ver. F: June 2018)

[Relevant Models] GOT1000 Series

Thank you for your continued support of Mitsubishi Electric Graphic Operation Terminal (GOT).

The GOT1000 series is certified by the classification societies described in Chapter 1.

When you use the GOT1000 series as the system that these classification societies approve, see the restrictions described in Chapter 2.

Please confirm the model, number, and expiration date, which each classification society approves, at the MITSUBISHI ELECTRIC FA Global Website.

MITSUBISHI ELECTRIC FA Global Website: <http://www.MitsubishiElectric.com/fa/>

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1. Classification societies to certificate type approval

GOT1000 series has acquired the Type Approval Certificate on the following classification societies.

American Bureau of Shipping	(Abbreviations: ABS)
Bureau Veritas	(Abbreviations: BV)
DNV GL	(Abbreviations: DNV GL)
Lloyd's Register	(Abbreviations: LR)
Nippon Kaiji Kyokai	(Abbreviations: NK)
Registro Italiano Navale	(Abbreviations: RINA)
Germanischer Lloyd	(Abbreviations: GL)

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2. Restrictions

The following describes the restrictions when the GOT1000 series is used as the system that is approved by the classification societies listed in Chapter 1.

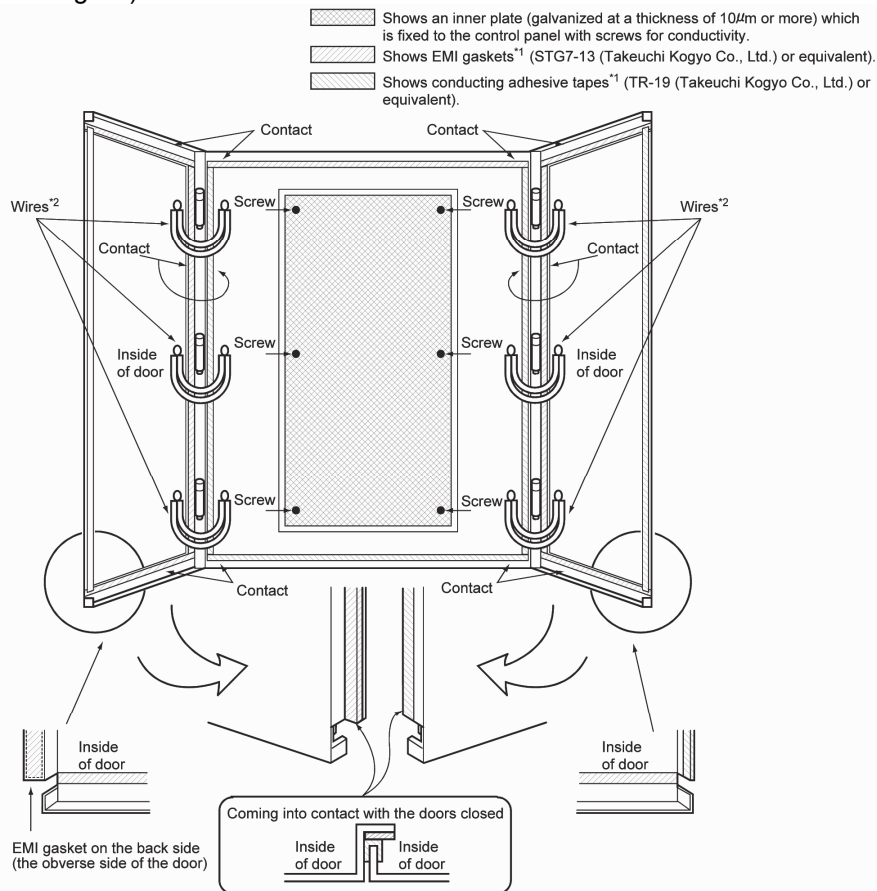
2.1 GOT installation

Place the installation fittings (included with the GOT) on the installation fitting attaching part of the GOT, and fix them by tightening the mounting screws in the specified torque range of 0.36 to 0.48N·m.

(Tightening the screws with a torque larger than the torque range may distort the panel and make a surface waviness on the protective sheet.)

2.2 Control panel

- The control panel must be conductive.
- When fixing a top or bottom plate of the control panel with bolts, remove the protective coating from both the plate and bolt surfaces to ensure that they come into electrical contact.
- When using an inner plate, ensure electric contact with the control panel, as an example. (Plating thickness: 10μm or more) (See Fig. 1.)
- In addition, remove the coating of the fixing bolt area of both the inner plate and the control panel to ensure conductivity in the largest area as possible.
- Ground the control panel with a thick ground wire (Cross-sectional area: 2mm² or more).
- To suppress the leakage of radio waves, the structure must have minimal openings.
- Ensure that the space between the control panel and its door is the smallest as possible by attaching some EMI gaskets between them. Also, the diameter of the cable hole must be 10cm or less.
- To ensure the electric contact between the control panel and its door, remove the coating of the contact areas, attach EMI gaskets and conducting adhesive tapes and connect the panel and the doors with thick wires. (See Fig. 1.)



*1 Do not apply coating to the parts where EMI gaskets and conducting adhesive tapes are to be attached.
 *2 These wires are used to strengthen conductivity between the doors and control panel.

Fig. 1 Example of Control Panel Inside

2.3 Connection of power wire and ground wire

The ground wire and the power wire for the GOT must be connected as described below.

- Provide a ground point near the GOT. Short-circuit the LG and FG terminals of the GOT (LG: line ground, FG: frame ground), and ground them with the thickest and shortest wire as possible (The wire length must be 30cm (11.81 inches) or shorter.). Since the LG and FG terminals pass the noise generated inside the GOT to the ground, ensure the lowest impedance as possible.

As the wires are used to discharge the noise, the wire itself carries large noise and thus short wiring means that the wire is prevented from acting as an antenna.

Note) A long conductor is an antenna to discharge noise more efficiently.

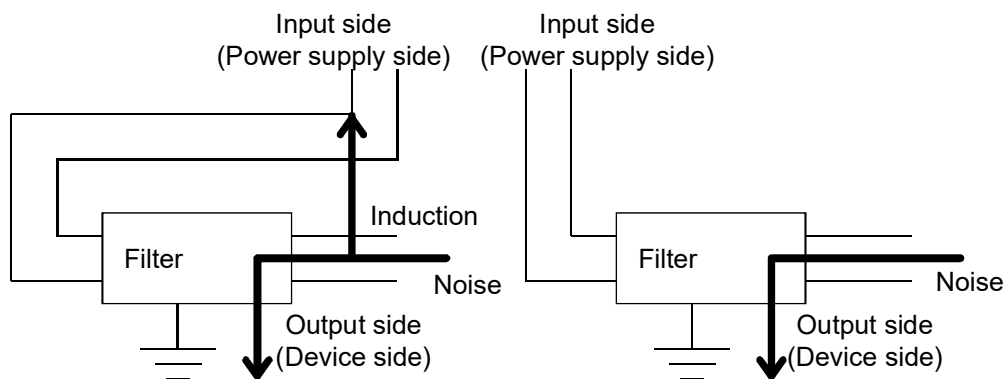
- Twist the ground wire led from the ground point with the power wire. By twisting the power wires with the ground wire, noise flowing from the power wires is discharged to a larger area on the ground. However, if a noise filter is installed on the power wires, the power wires and the ground wire may not need to be twisted.

2.4 Noise filter installation

Make sure to attach a noise filter to the power cable. (See 1) in Section 2.9.)

Use the noise filter FR-S5NFSA-1.5K (Mitsubishi Electric Corporation), RSHN-2006 (TDK-Lambda Corporation), or the equivalent.

- Do not install the input and output cables of the noise filter together. Doing so inducts the noise of the output cable to the input cable where noise is removed.



• Installing the input and output cables together will cause noise induction.

• Separate the input cable from the output cable

Fig. 2 Precautions on noise filter

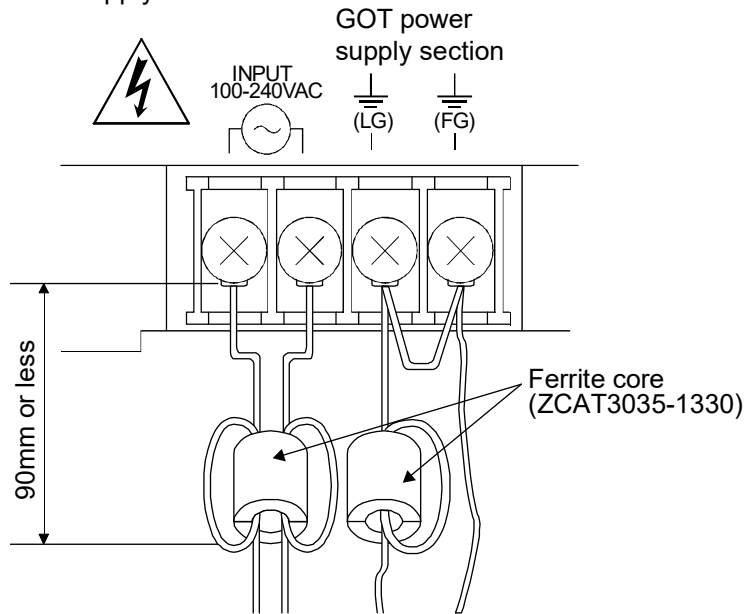
- Ground the noise filter's ground terminal to the control panel with the shortest cable as possible (approx. 10cm (3.94 inches) or less).

2.5 Wiring method of power wire and ground wire

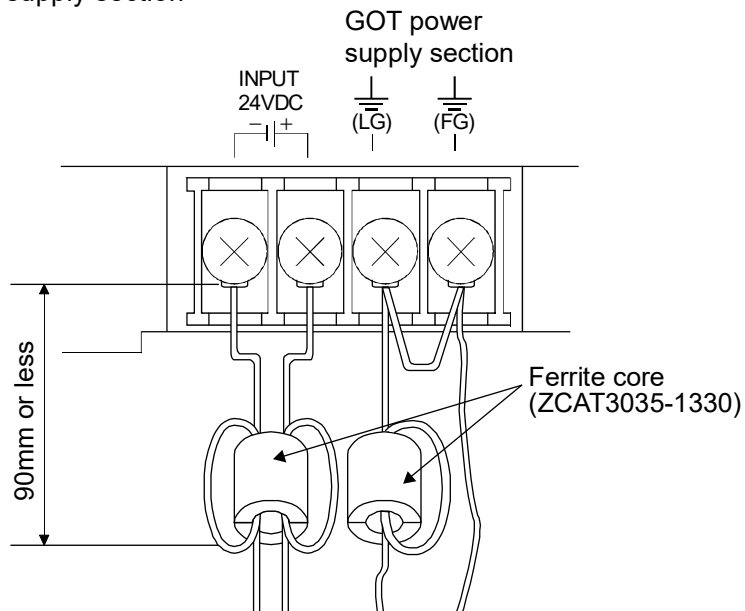
Connect the power wires and the ground wires as shown in the figures, and attach a ferrite core (ZCAT3035-1330 manufactured by TDK Corporation) within the range shown below if needed. (See 2) in Section 2.9.)

(a) GT16

1) 100-240VAC GOT power supply section



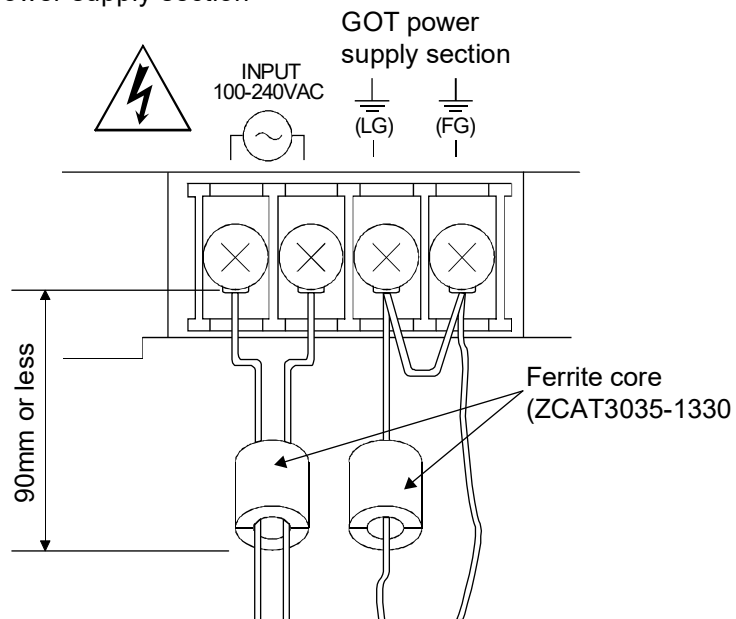
2) 24VDC GOT power supply section



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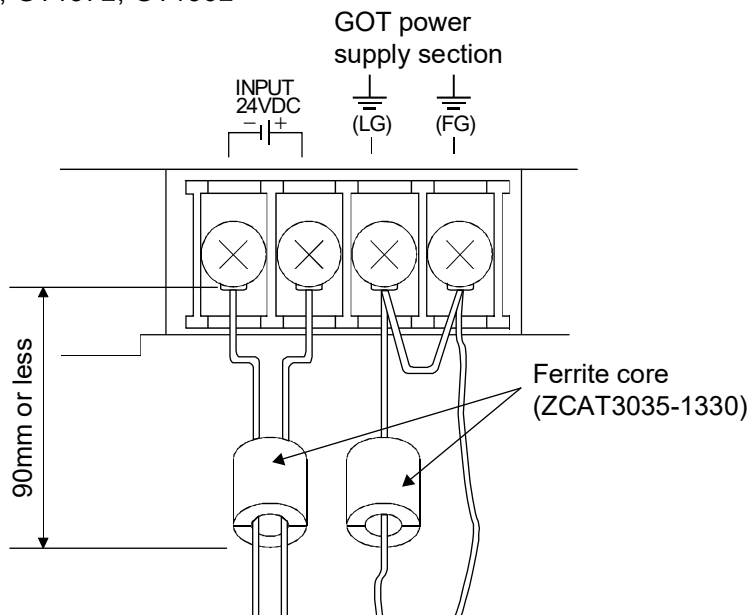
(b) GT15, GT11

1) 100-240VAC GOT power supply section

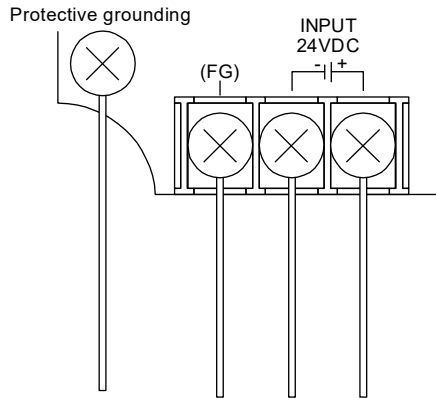


2) 24VDC GOT power supply section

- GT1595, GT1585, GT157□, GT156□

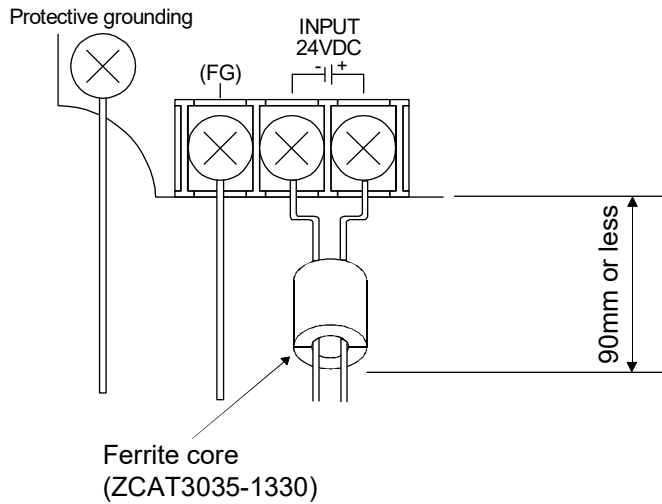


- GT155□

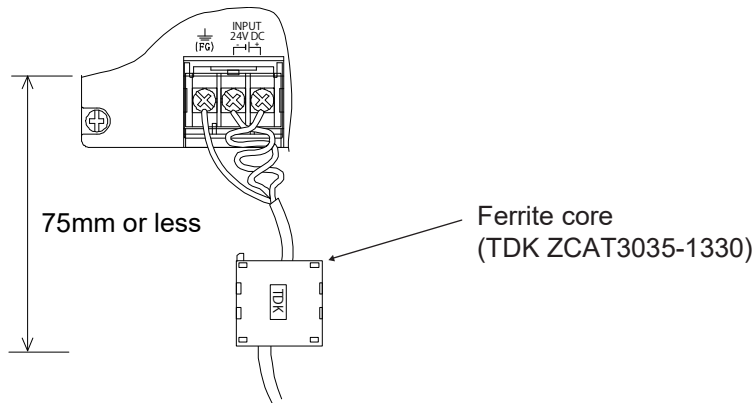


•Make sure to ground the protective ground terminal and the FG terminal respectively.

- GT155□ with CC-Link IE controller network communication unit mounted



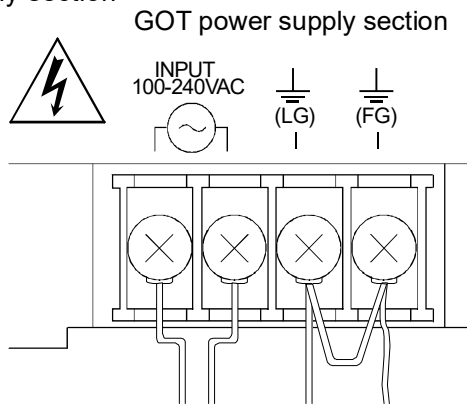
- GT1155-QTBDQ, GT1155-QTBDA, GT1155-QSBDQ, GT1155-QSBDA, GT1155-QLBDQ, GT1155-QLBDA



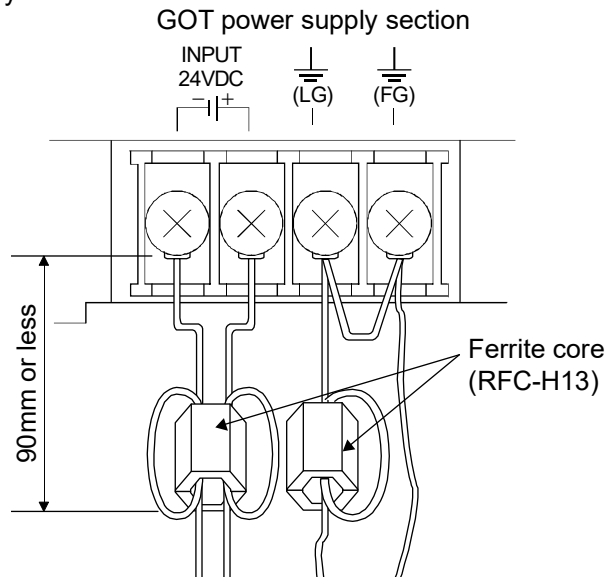
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(c) GT12

1) 100-240VAC GOT power supply section



2) 24VDC GOT power supply section



2.6 Fabrication method of connection cables

Fabricate the cable used with the GOT with the following method. When fabricating the cable, a ferrite core, a cable clamp, and a cable shield material are required. (See 3) in Section 2.9.)

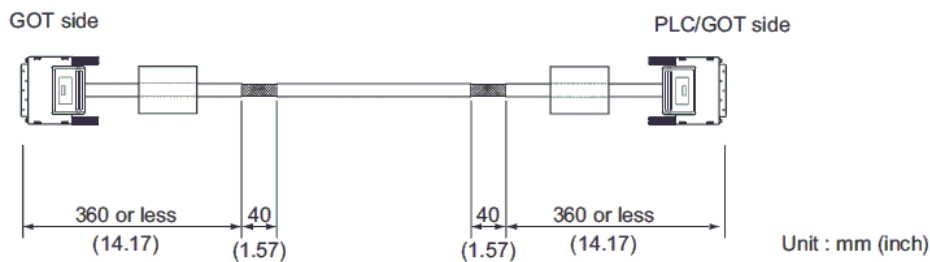
The products used by Mitsubishi Electric Corporation for the Type Approval Certificate compatibility test are as shown below.

- Ferrite core : ZCAT3035-1330 ferrite core manufactured by TDK Corporation
- Cable clamp : AD75CK cable clamp manufactured by Mitsubishi Electric Corporation
- Cable shield material : Zipper tube type SHNJ manufactured by Zippertubing (Japan),Ltd.

(a) BUS connection

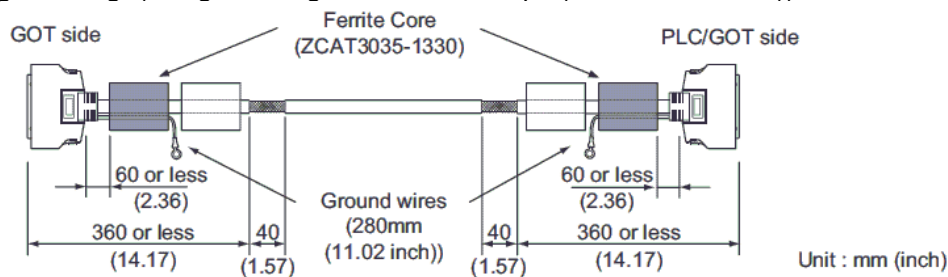
1) GT15-QC□B, GT15-QC□BS

- Strip the sheath (with the strip-off length shown below) at both ends of the cable to expose the braided shield for grounding. (For grounding with cable clamps (See Section 2.7.))



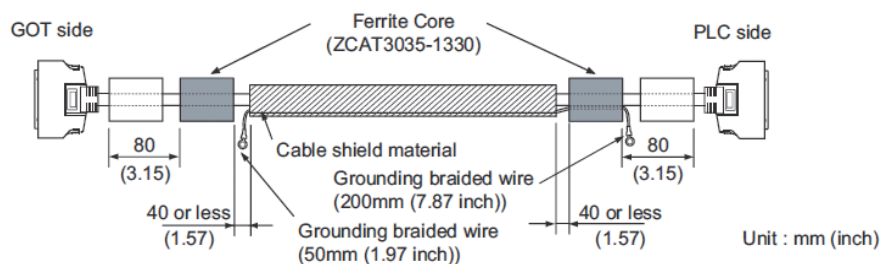
2) GT15-C□BS

- Cut the ground wires protruding from both ends of the cable to the length shown below.
- Attach the ferrite cores to the cable in the positions as illustrated below and insert the ground wires into the ferrite cores.
- Strip the sheath (with the strip-off length shown below) at both ends of the cable to expose the braided shield for grounding. (For grounding with cable clamps (See Section 2.7.))



3) Other bus connection cables

- Wrap a cable shield material around the cable, and pull out the grounding braided wire from the cable shield material with the length shown below.
- Attach ferrite cores to the cable in the positions as illustrated below and insert the grounding braided wire at the PLC side into the ferrite core.



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(b) Direct CPU direct connection and computer link connection

1) GT16

- Attach ferrite cores to the cable in the positions as illustrated below.

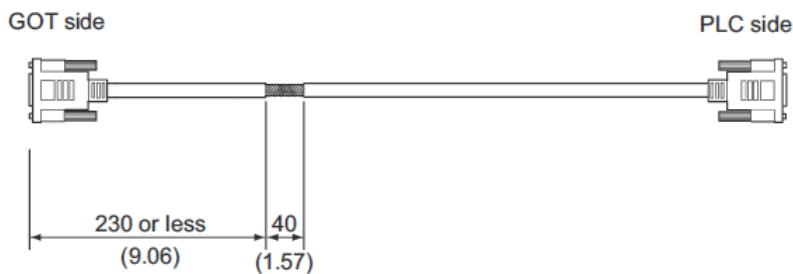


Unit : mm (inch)

2) GT15, GT12, GT11

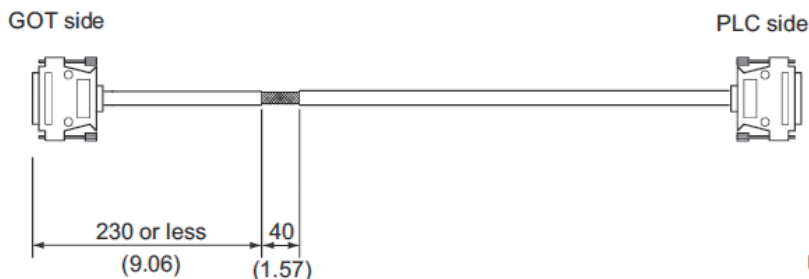
- Strip the sheath (with the strip-off length shown below) of the cable to expose the braided shield for grounding. (For grounding with cable clamps (See Section 2.7.))

(i) RS-232 cable



Unit : mm (inch)

(ii) RS-422 cable

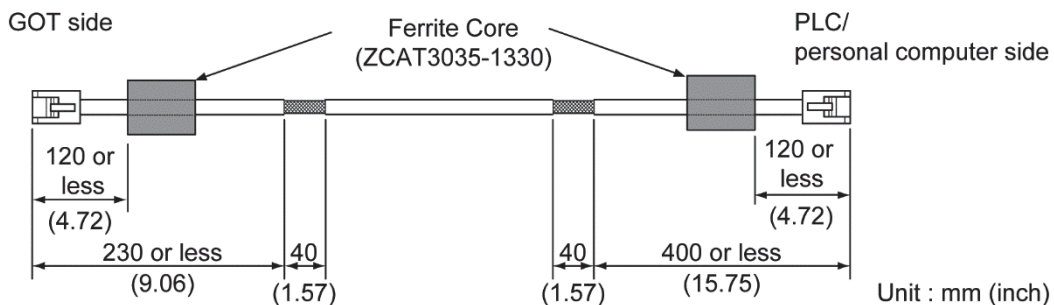


Unit : mm (inch)

(c) Ethernet connection

- Strip the sheath (with the strip-off length shown below) at both ends of the cable to expose the braided shield for grounding. (For grounding with cable clamps (See Section 2.7.))
- Attach a ferrite core to the cable in the position as illustrated below.

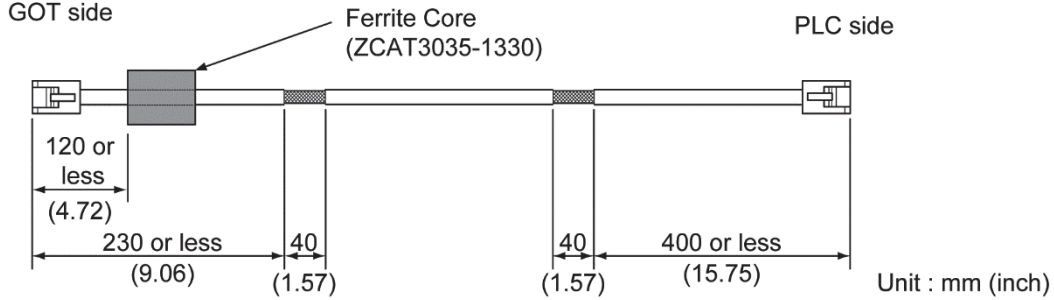
1) GT16



Unit : mm (inch)

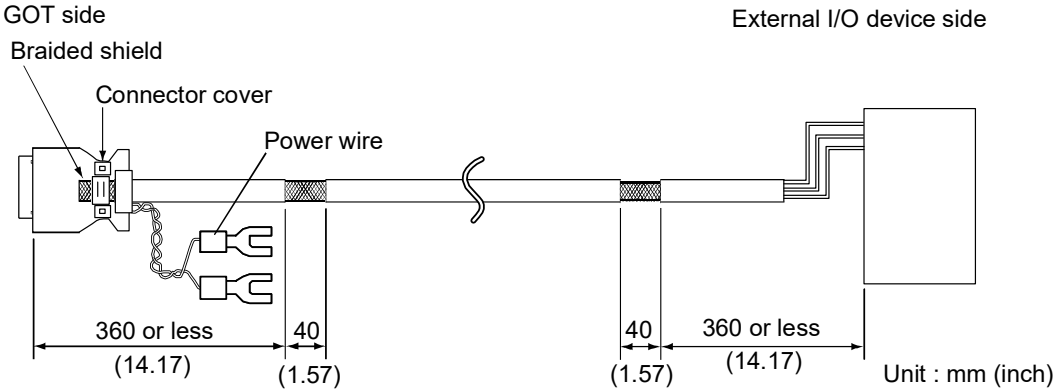
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2) GT15, GT12, GT11



(d) External I/O device connection

- Strip the sheath (with the strip-off length shown below) at both ends of the cable to expose the braided shield for grounding. (For grounding with cable clamps (See Section 2.7.))
- Connect the braided shield cable to the connector with the connector cover.
- Twist power wires.



(e) Connection of third party PLC, microcomputer, temperature controller, inverter, servo amplifier, CNC, MODBUS(R)/RTU or MODBUS(R)/TCP

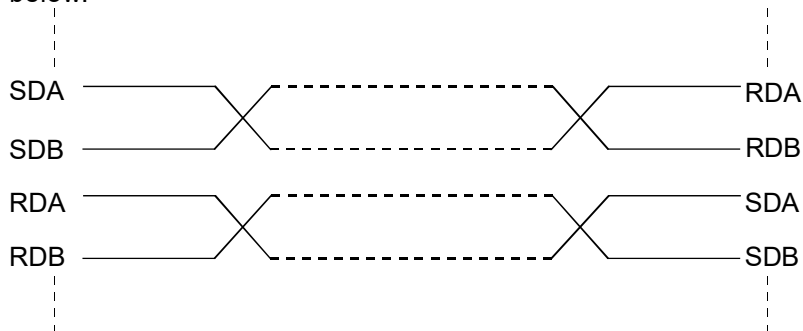
The user is required to produce a cable (RS-232 cable or RS-422/485 cable) for connecting the GOT to a controller.

For how to produce the cable, refer to the GOT1000 Series Connection Manual.

1) GT16

(i) RS-422/485 cable

- When connecting each signal wire (excluding the SG wire and the FG wire), twist two signal wires as illustrated below.

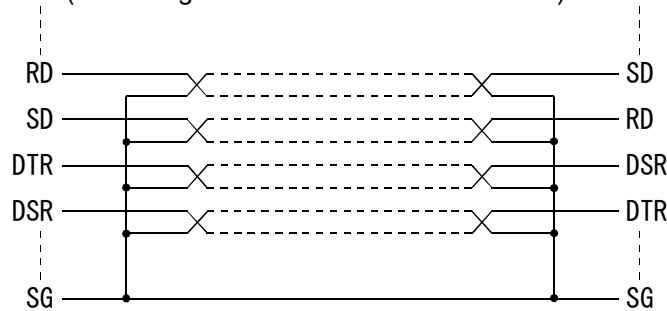


- Connect two or more SG wires.

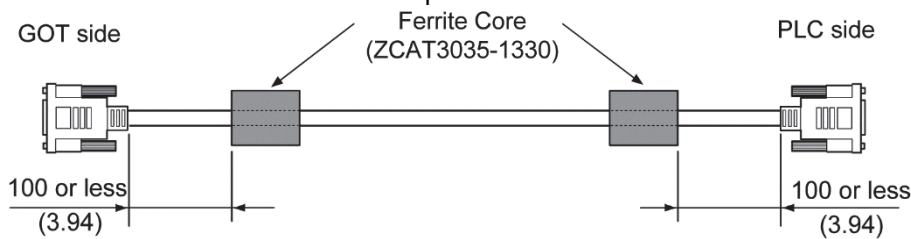
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(ii) RS-232 cable

- Twist each signal wire (excluding the SG wire and the FG wire) with the SG wire.



- Attach ferrite cores to the cable in the positions as illustrated below.

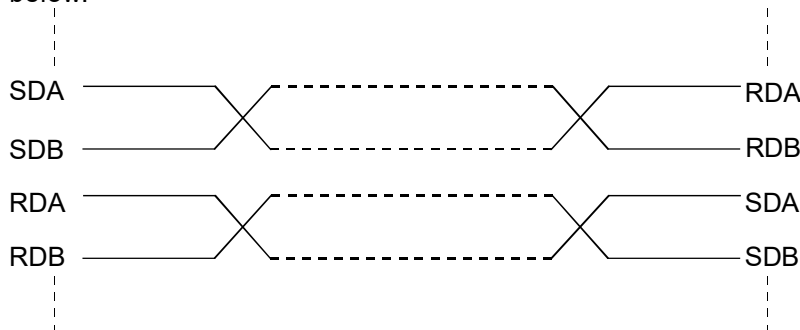


Unit : mm (inch)

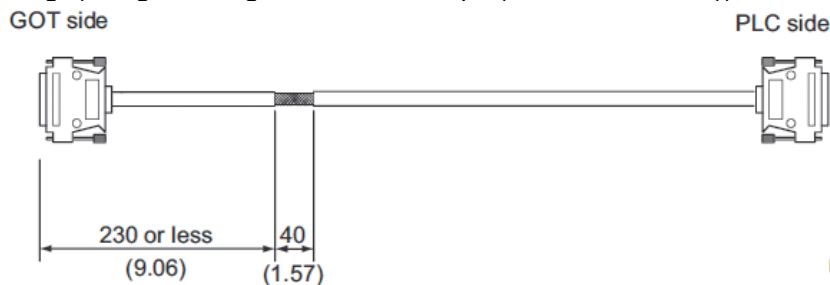
2) GT15, GT12, GT11

(i) RS-422/485 cable

- When connecting each signal wire (excluding the SG wire and the FG wire), twist two signal wires as illustrated below.



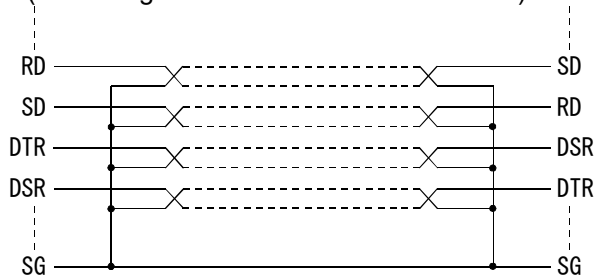
- Connect two or more SG wires.
- Strip the sheath (with the strip-off length shown below) of the cable to expose the braided shield for grounding. (For grounding with cable clamps (See Section 2.7.))



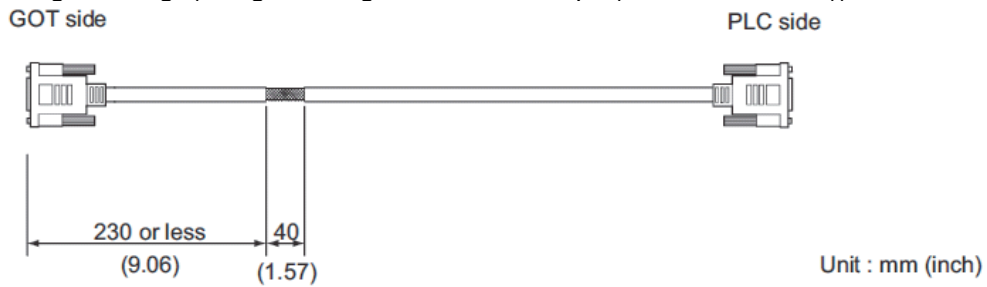
Unit : mm (inch)

(ii) RS-232 cable

- Twist each signal wire (excluding the SG wire and the FG wire) with the SG wire.



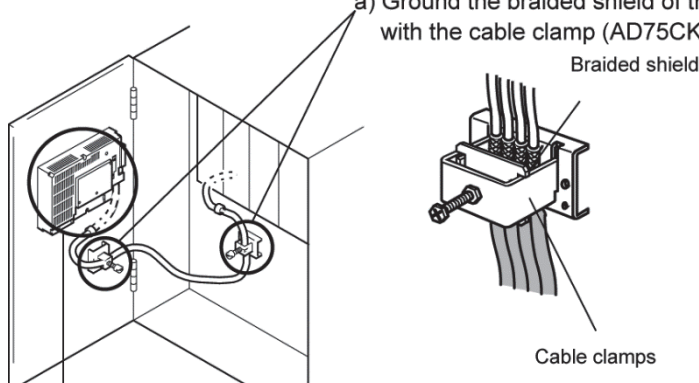
- Strip the sheath (with the strip-off length shown below) of the produced cable to expose the braided shield for grounding. (For grounding with cable clamps (See Section 2.7.))



2.7 Grounding the cable

Ground the cable and the ground wire to the control panel where the GOT and the base unit are installed.

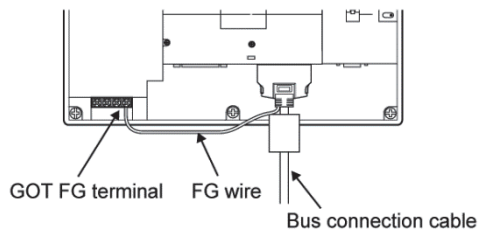
- a) Ground the braided shield of the cable to the control panel with the cable clamp (AD75CK).



For the cable clamp attaching details, refer to AD75CK-type Cable Clamping Instruction Manual <IB-68682>.

- (i) For GT15-C□EXSS-1 and GT15-C□BS

Ground the ground wire to the FG terminal of the GOT power supply section.



- (ii) For other bus connection cables

Ground the braided wire for grounding to the control panel by tightening a screw.

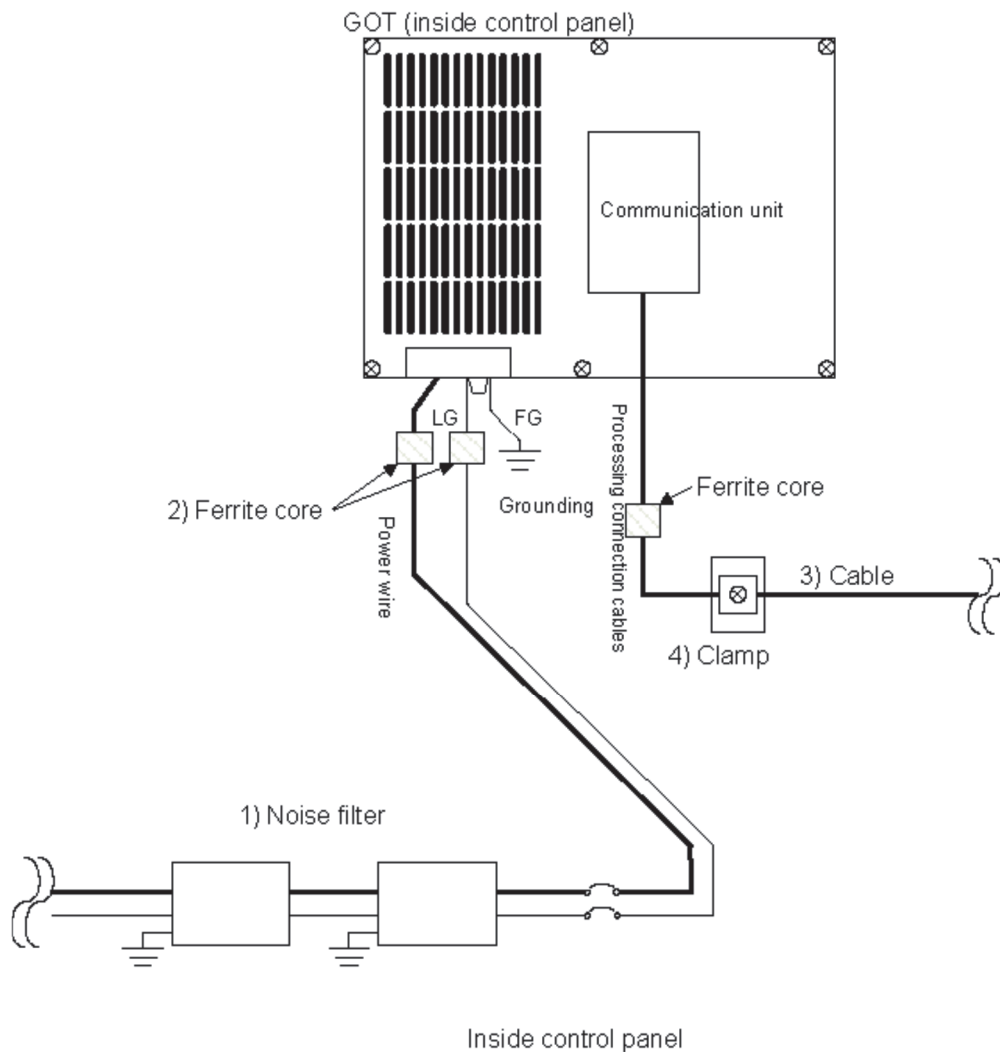
- 2) Do not arrange the cable clamp adjacent to other cables which do not clamp. Noise from the control panel may access the GOT from the cable clamp and cause adverse effects.

2.8 Equipment maintenance

To use the GOT1000 series, work such as maintenance and inspection must be done by a maintenance worker.

The maintenance worker designates a person who has taken appropriate education and training, has work experience, can catch hazards in operation, and can avoid them.

2.9 Example of attaching noise filter/ferrite core inside control panel



REVISIONS

Version	Print Date	Revision
-	May 2009	- First edition
A	-	-
B	November 2009	- Added RINA.
C	June 2010	- Descriptions are revised because of the reacquisition of the Type Approval Certificate.
D	January 2011	- Added GL. - Descriptions are added because of the acquisition of the Type Approval Certificate for the GT16.
E	August 2015	- Changed title.
F	June 2018	- Changed the descriptions of "1. Classification societies to certificate type approval" because of the merger of the classification societies.