

# FURUNO

# OPERATOR'S MANUAL

INTERFACE UNIT

MODEL IF - 2000



**FURUNO ELECTRIC CO., LTD.**  
NISHINOMIYA, JAPAN

©FURUNO ELECTRIC CO., LTD.

9-52, Ashihara-cho,  
Nishinomiya, Japan 662

Telephone: 0798-55-2111  
Telefax: 0798-55-4200 (G111)

All rights reserved. Printed in Japan

(ETMI)

PUB. No. OME-43420  
IF-2000

-Your Local Agent/Dealer

Initial : JAN 1991  
C : NOV. 25, 1996



\* 0 0 0 8 0 2 6 5 1 0 0 \*



# SAFETY INSTRUCTIONS

"DANGER", "WARNING" and "CAUTION" notices appear throughout this manual. It is the responsibility of the operator of the equipment to read, understand and follow these notices. If you have any questions regarding these safety instructions, please contact a FURUNO agent or dealer.

The level of risk appearing in the notices is defined as follows:



## DANGER

This notice indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury.



## WARNING

This notice indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



## CAUTION

This notice indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury, or property damage.



## WARNING



### **Do not open the equipment.**

Hazardous voltage which can cause electrical shock, burn or serious injury exists inside the equipment. Only qualified personnel should work inside the equipment.

### **Do not disassemble or modify the equipment.**

Fire, electrical shock or serious injury can result.

### **Turn off the power immediately if water leaks into the equipment or the equipment is emitting smoke or fire.**

Continued use of the equipment can cause fire or electrical shock.

### **Do not place liquid-filled containers on the top of the equipment.**

Fire or electrical shock can result if a liquid spills into the equipment.

### **Do not operate the equipment with wet hands.**

Electrical shock can result.

### **Keep heater away from equipment.**

Heat can alter equipment shape and melt the power cord, which can cause fire or electrical shock.



## CAUTION

### **Use the proper fuse.**

Use of a wrong fuse can result in fire or permanent equipment damage.

### **Do not use the equipment for other than its intended purpose.**

Personal injury can result if the equipment is used as a chair or stepping stool, for example.

### **Do not place objects on the top of the equipment.**

The equipment can overheat or personal injury can result if the object falls.

## TABLE OF CONTENTS

SPECIFICATIONS .....	-1-
EQUIPMENT LIST .....	-2-
CHAPTER 1 OPERATION .....	1-1 to 1-5
1. OPERATION .....	1-1
2. DATA INPUT AND OUTPUT .....	1-1
1) Data distribution. ....	1-1
2) 7 CIF outputs .....	1-2
3) LOG input .....	1-3
3. FUSE REPLACEMENT .....	1-3
4. SELF TEST .....	1-3
1) Automatic self test .....	1-3
2) Self test triggered by JP2. ....	1-4
5. LED STATUS .....	1-5
CHAPTER 2 INSTALLATION .....	2-1 to 2-4
1. INSTALLATION .....	2-1
1) General notes on installation. ....	2-1
2) Mounting the unit. ....	2-1
3) Mounting dimensions .....	2-2
4) Mounting procedure .....	2-2
2. CABLE FABRICATION .....	2-3
3. POWER SUPPLY .....	2-4
4. GROUNDING .....	2-4
CHAPTER 3 PARTS LOCATION .....	3-1
OUTLINE DRAWING .....	D-1
INTERCONNECTION DIAGRAMS .....	S-1

## SPECIFICATIONS OF INTERFACE UNIT IF-2000

### General

The FURUNO IF-2000 interface unit distributes CIF data, AD-10S format GYRO data and contact closure LOG signal. Two CIF inputs are combined into one line then distributed to three outputs. One GYRO input to three outputs and one LOG input to three outputs.

### Specifications

- |                      |   |
|----------------------|---|
| 1. Input Ports       | CIF --- 2 ports<br>GYRO -- 1 ports (AD-10S Format)<br>LOG --- 1 port (Contact Closure Signal) |
| 2. Output Ports      | CIF --- 3 ports<br>GYRO -- 3 ports<br>LOG --- 3 ports   |
| 3. Power Supply      | 8VDC to 42VDC   |
| 4. Power Consumption | 0.1 A (8VDC to 42VDC)   |
| 5. Dimensions        | 230 (W) x 50 (H) x 188 (D) (mm)   |
| 6. Weight            | 1.5 kg  |
| 7. Color             | 2.5G5/1.5 Newton No.5   |

## EQUIPMENT LIST

## COMPLETE SET

No.	NAME	TYPE	CODE No.	Qty	REMARKS
1	Main Unit	IF-2000	000-041-376	1	
2	Installation Materials	CP14-03500	000-041-377	1	
3	Spare Parts	SP14-01100	000-043-093	1	

## INSTALLATION MATERIALS (CP14-03500)

No.	NAME	TYPE	CODE No.	Qty	REMARKS
1	Tapping Screw	4x16 SUS304	000-802-080	4	
2	NH Connector Assy.	14-273 (3P)	004-397-570	5	
3	NH Connector Assy.	14-274 (4P)	004-397-580	4	
4	NH Connector Assy.	14-275 (5P)	004-397-590	4	
5	VH Connector Assy.	14-276 (2P)	004-397-600	1	
6	Heat Shrink Tube F	3x0.25 1m	000-568-172	1	Black
7	Heat Shrink Tube F	10x0.25 0.5m	000-123-379	1	Black
8	Sticker	14-042-3101	100-146-940	1	

## SPARE PARTS (SP14-01100)

No.	NAME	TYPE	CODE No.	Qty	REMARKS
1	Fuse	FGMB 0.5A 125V	000-114-994	3	

## CHAPTER 1 OPERATION

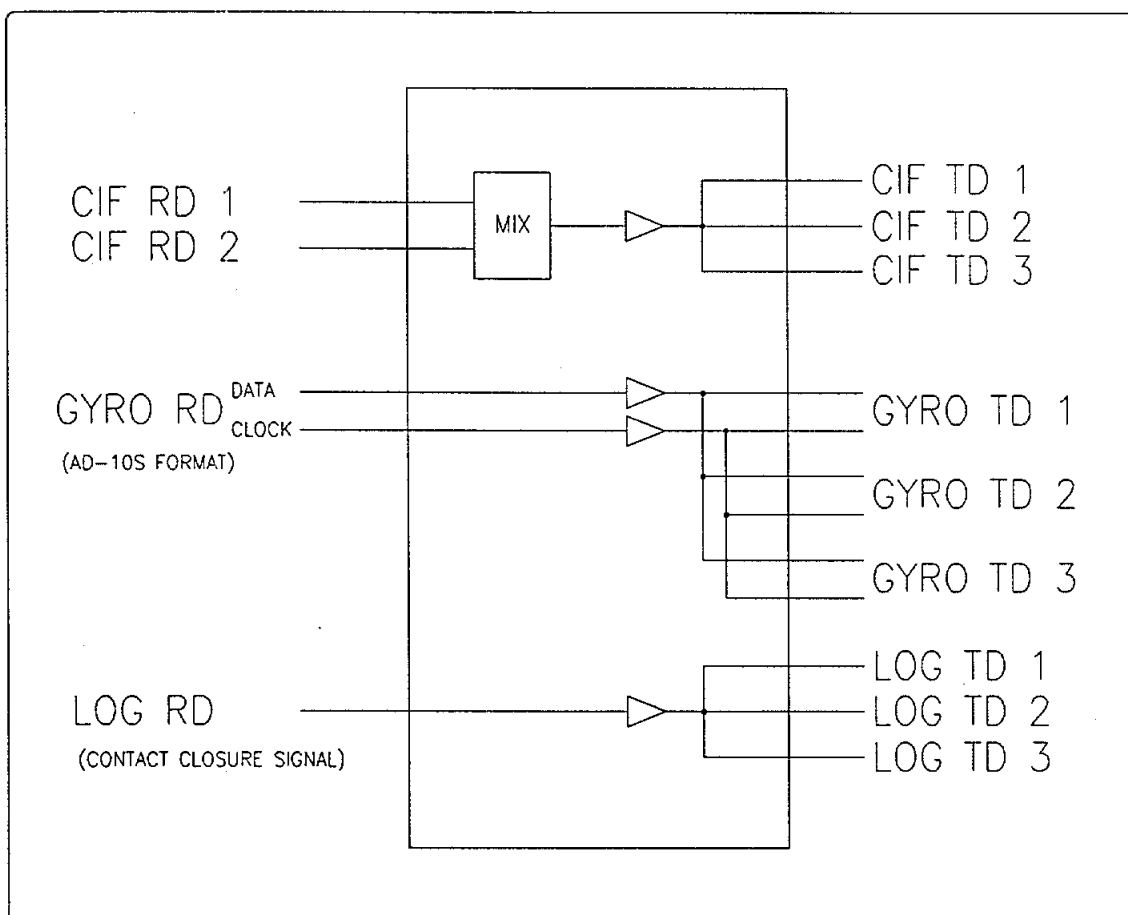
### 1. OPERATION

In normal operation, nothing is required of the operator, because the power to the interface unit is turned on/off with an external power supply.

### 2. DATA INPUT AND OUTPUT

#### 1) Data distribution

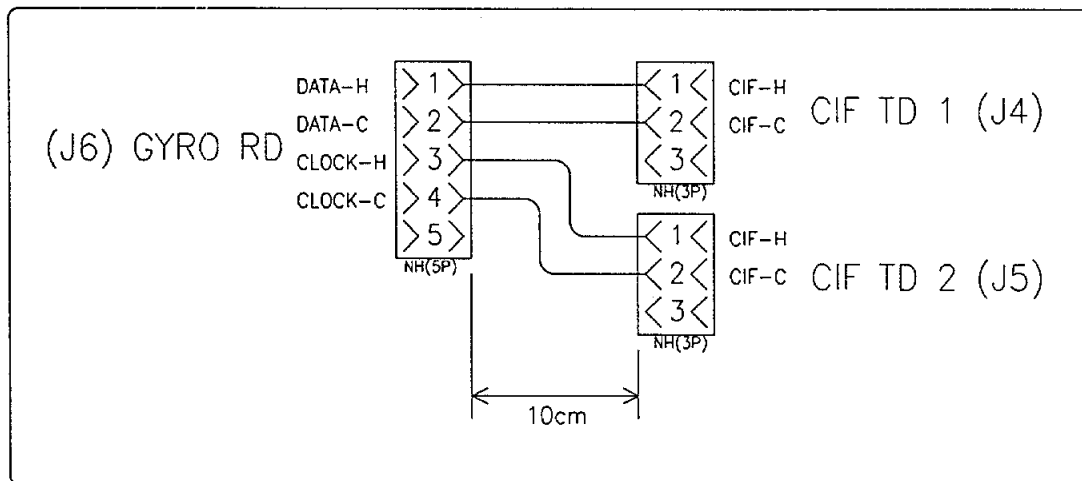
DATA	INPUT	OUTPUT
CIF data	2	3
GYRO data in AD-10S format	1	3
LOG contact closure signal	1	3



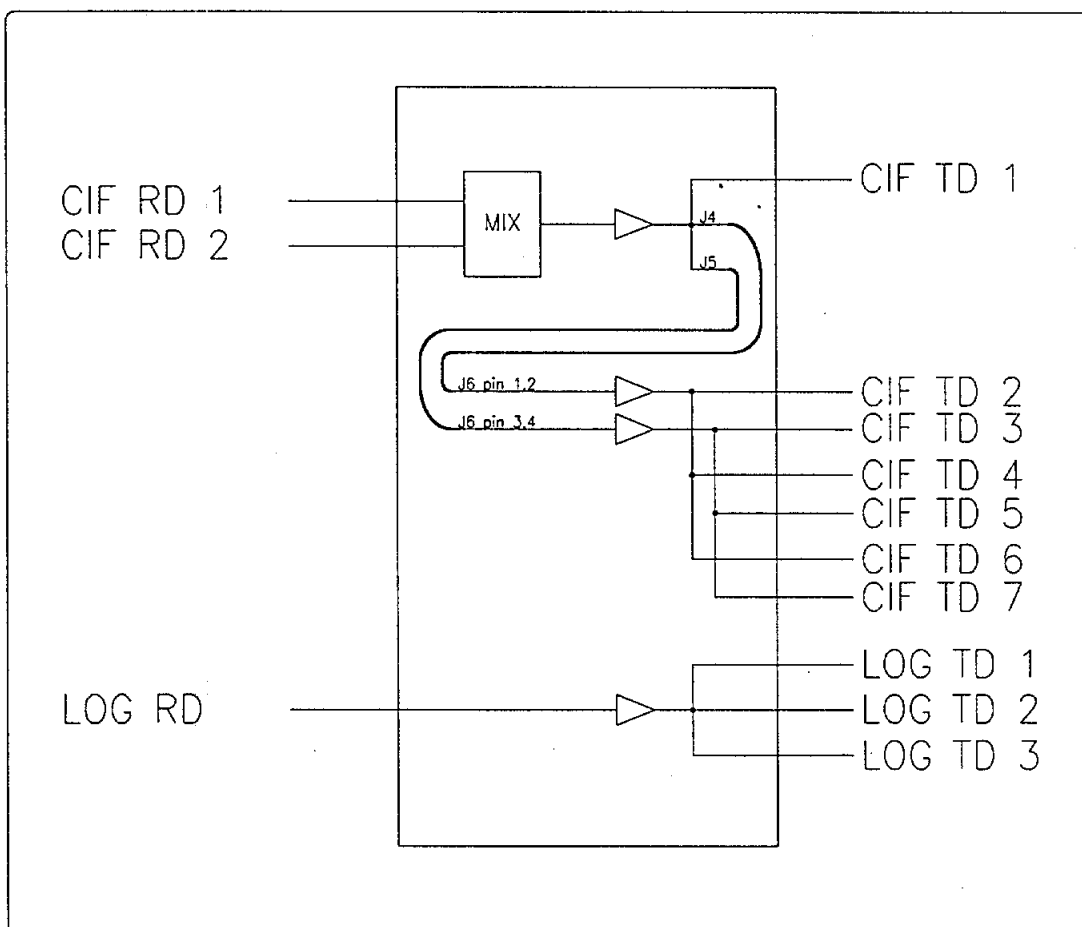
## 2) 7 CIF outputs

Seven CIF output ports are available by using GYRO distributor as CIF data distributor. See the second figure below.

Locally prepare the jumper cables shown below, then change the internal connections as shown by bold lines in the figure. One CIF output to GYRO data input and the other CIF output to GYRO clock input.



JUMPER WIRE



CHANGE THE INTERNAL CONNECTION FOR SEVEN CIF OUTPUTS

### 3) LOG input

If the input LOG signal is interfered with noise, change the pulse width setting of the LOG contact closure signal, by jumpers JP3 and JP4. The input pulse width must be wider than the value in the table. The width of the output pulse is fixed at 150 msec.

JP3	JP4	PULSE WIDTH	REMARKS
OPEN	OPEN	about 1 msec	Factory setting
SHORT	OPEN	about 12 msec	
SHORT	SHORT	about 125 msec	

The values in the table are approximate and vary according to device connected. Check the LOG contact closure signal output at pins 1 and 2 of J11 or J12 or J13 after changing the input pulse width setting. If no output, lower the pulse width.

### 3. FUSE REPLACEMENT

To protect the unit from serious damage, a 0.5A fuse is provided on the unit's lone P.C. board. The fuse protects against overvoltage or internal fault of the equipment. If the fuse blows, find the cause of the problem before replacing it.

#### CAUTION

Do not use a fuse rated more than 0.5A, since it may cause more serious damage to the equipment.

### 4. SELF TEST

The IF-2000 employs self tests to check it for proper operation.

#### 1) Automatic self test

A simple check of the equipment is done each time the power is turned on.

#### Sequence

- (1) LEDs CR13 to CR16 each light every two seconds twice then turn off.
- (2) The items below are tested.

#### Items Tested

ROM Test  
RAM Test  
SIO Test (CPU Loop back test)

- (3) LED CR13 blinks every second for normal operation.

## RESULT OF THE SELF TEST

Error is shown by the status of LEDs CR13 to CR16.

LED	STATUS	RESULTS
CR13	Blinks every second. Blinks every 0.5 seconds.	No error. Error detected (See below).
CR14	ON	SIO (CPU loop back) error.
CR15	ON	Defective RAM.
CR16	ON	Defective ROM.

### Remedy

Replace the P.C. board.

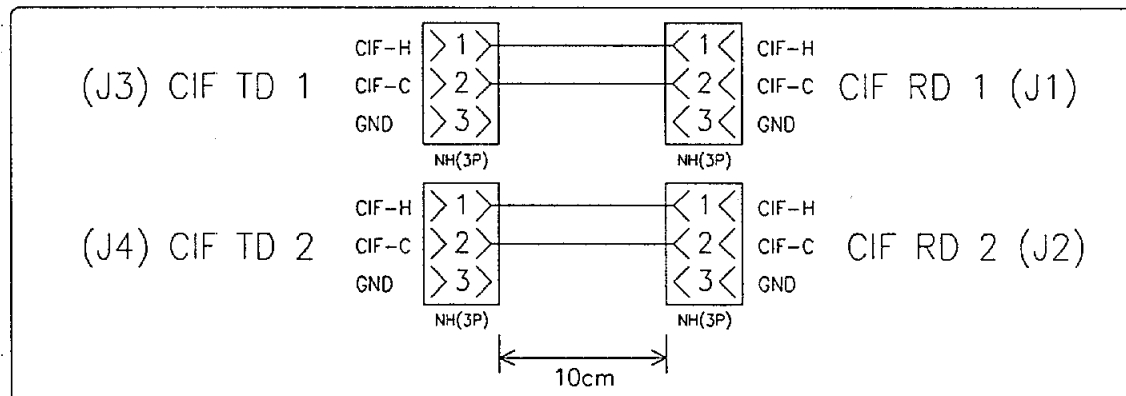
NAME	TYPE	CODE No.	Qty
CPU Board	14P0231	004-397-680	1

## 2) Self test triggered by JP2

Plug in jumper block JP2 before turning on the equipment.

This test checks I/O and requires an external loop. Temporarily disconnect the data input and output connectors J1, J2, J3 and J4. Shorten J1 and J3, J2 and J4 with the external loop (shown below).

### EXTERNAL LOOP



### Sequence

- (1) LEDs CR13 to CR16 each light every two seconds twice then turn off.
- (2) The items below are tested.

#### Items Tested

ROM Test  
RAM Test  
SIO Test (CPU Loop back test)  
I/O Test (Data input/output test)

(3) The test repeats itself. (To escape from the test, turn off the power by disconnecting the power cable.)

#### RESULT OF THE SELF TEST

Error is shown by the status of LEDs CR13 to CR16.

LED	STATUS	RESULTS
CR13	Blinks every second. Blinks every 0.5 seconds.	No error. Error detected (see below).
CR14	Lights	SIO (CPU loop back) error. I/O (Data input/output) error.
CR15	Lights	Defective RAM.
CR16	Lights	Defective ROM.

#### Remedy

Replace the P.C. board.

NAME	TYPE	CODE No.	Qty
CPU Board	14P0231	004-397-680	1

#### 5. LED STATUS

LED	STATUS
CR 8	Lights when power is supplied.
CR 9	Lights when sending self test data.
CR10	Lights when receiving CIF data (J1).
CR11	Lights when sending CIF data (J3 - J5).
CR12	Lights when receiving CIF data (J2).
CR13	Blinks every second when no error. Blinks every 0.5 sec when error is detected.
CR14	Lights when the I/O error or SIO error is detected.
CR15	Lights when the RAM is defective.
CR16	Lights when the ROM is defective.
CR17	Lights when sending GYRO data (J7 - J9).
CR18	Lights when sending GYRO clock (J7 - J9).
CR19	Lights when receiving LOG signal (J11).

## CHAPTER 2 INSTALLATION

### 1. INSTALLATION

#### 1) General notes on installation

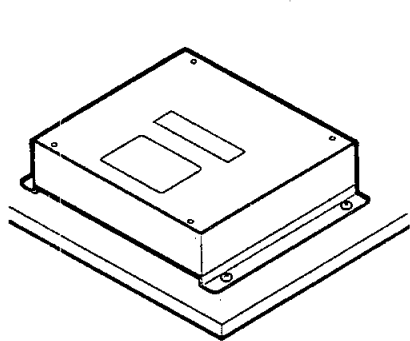
This equipment provides its intended function only when it is installed properly. The installation site is important for proper operation and continued performance. Select it keeping the following points in mind.

- (1) Keep away from water spray.
- (2) Select a clean and cool place.
- (3) Select a place where shock, vibration and noise are minimal.

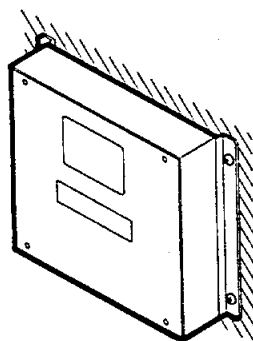
#### NOTE

FURUNO will assume no responsibility for the damage caused by water spray.

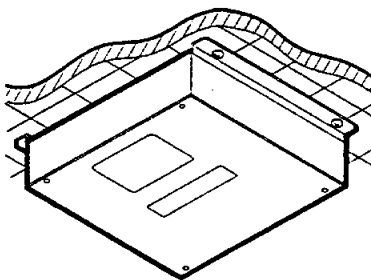
#### 2) Mounting the unit



TABLETOP

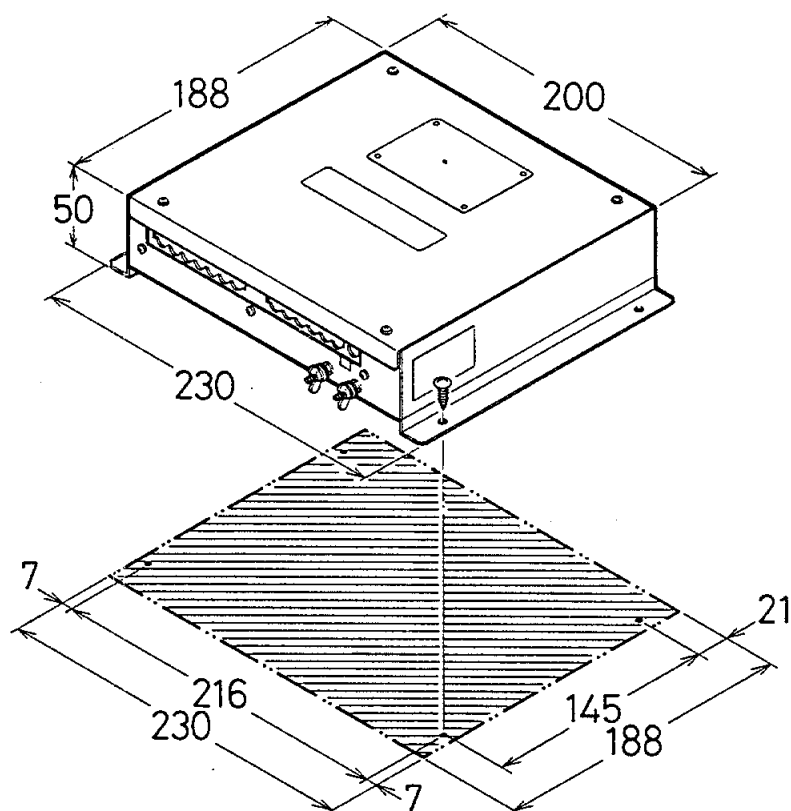


BULKHEAD



OVERHEAD

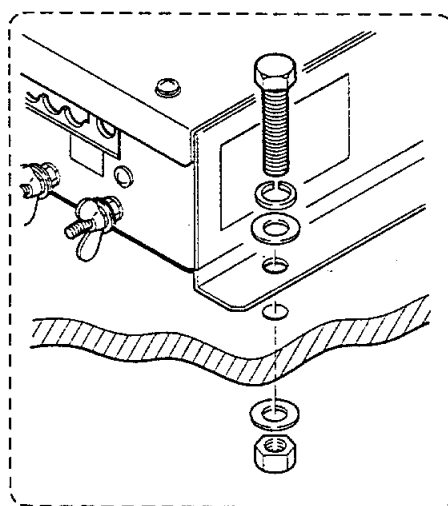
### 3) Mounting dimensions



All dimensions in millimeters.

For thin walls, use nuts, bolts and washers instead of woodscrews.

Secure sufficient space around the unit for maintenance and checking.



### 4) Mounting procedure

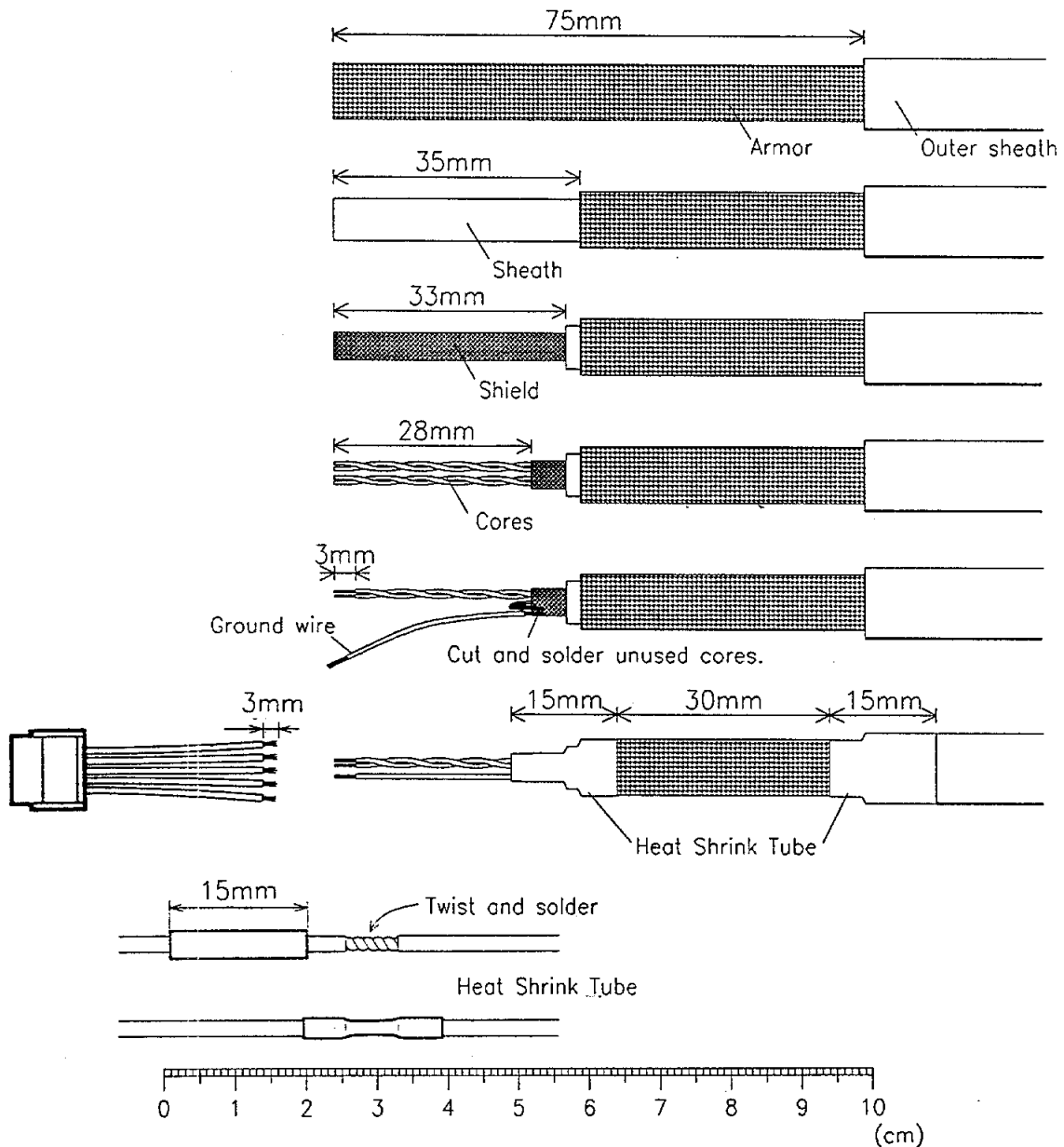
(1) Drill pilot holes.

(2) Fix the unit with tapping screws (supplied).  
For thin walls, use bolts and nuts instead of the tapping screws.

## 2. CABLE FABRICATION

- (1) Remove the outer sheath, armor, sheath and shield as illustrated.
- (2) Remove the insulation of cores by 3 mm. Cut and solder unused cores to the shield.
- (3) Solder a ground wire to the shield.
- (4) Dress the shield and the outer sheath with heat shrink tube, leaving 30mm of shield and outer sheath exposed.
- (5) Heat the heat shrink tube.
- (6) Remove the insulation of NH connector (supplied) by 3 mm.
- (7) Pass the cable through heat shrink tube. Solder cable and core.
- (8) Heat the heat shrink tube.

Note : Ground the armor through the cable clamp.



### 3. POWER SUPPLY

This unit accomodates supply voltage from 8VDC to 18VDC or 18VDC to 42VDC, by a jumper wire (JP1). The default setting is 18VDC to 42VDC (OPEN). For 8VDC to 18VDC, short the jumper by twining the lead wire around the pins and solder.

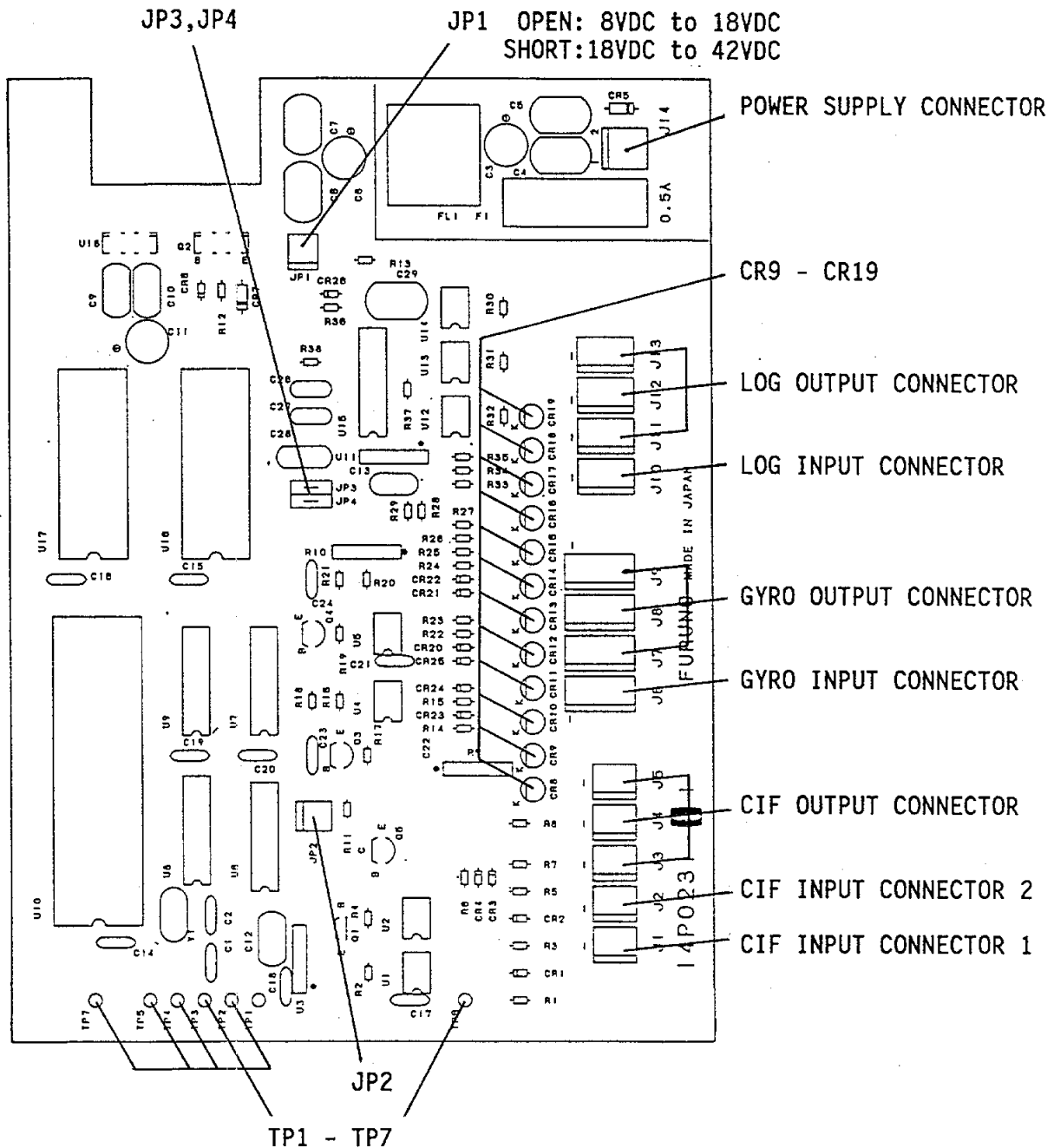
Voltage	JP1
8VDC to 18VDC 18VDC to 42VDC	SHORT OPEN

### 4. GROUNDING

Ground the unit with a copper strap to prevent interference to nearby equipment.

## CHAPTER 3 PARTS LOCATION

### 1. PARTS LOCATION

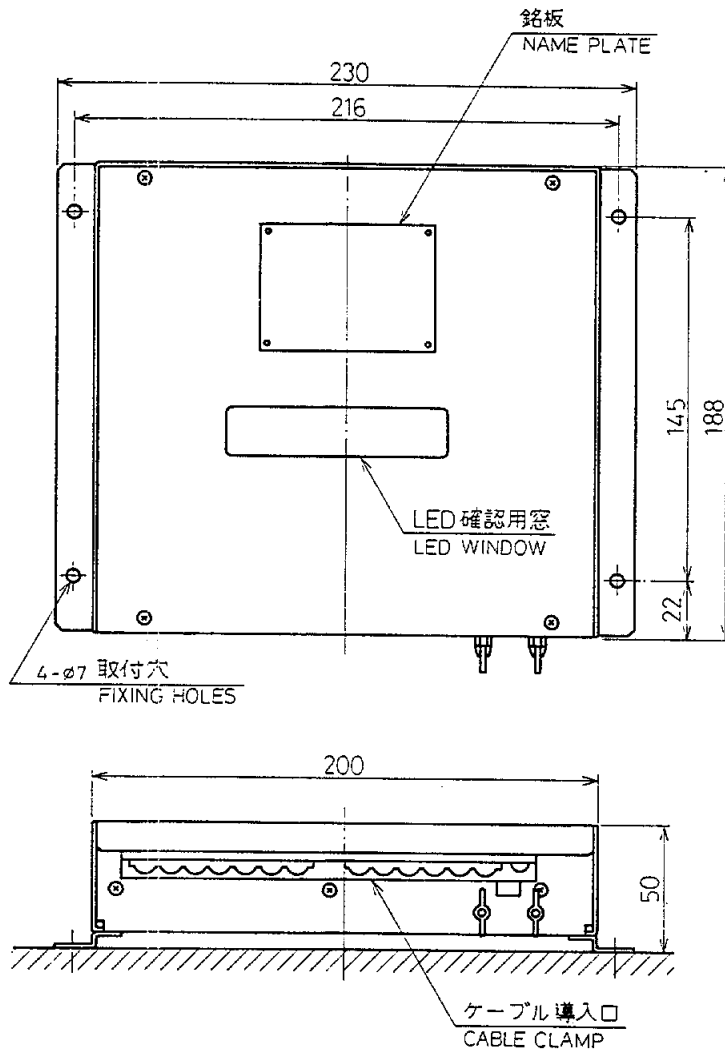


A

B

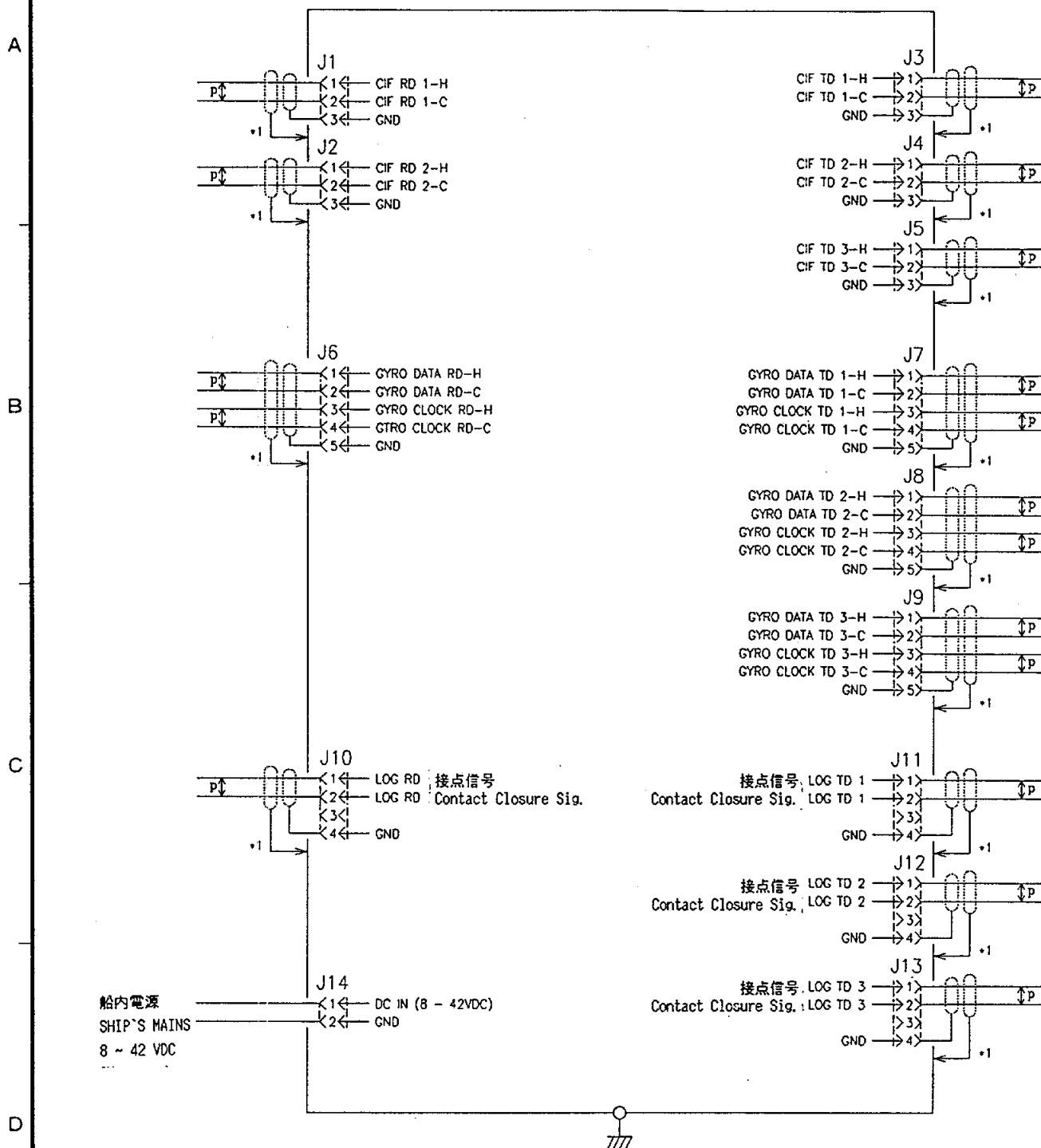
C

D



品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS
承認 APPROVED	DEC. 17. 90 T. NAKANO	三角法 THIRD ANGLE PROJECTION	名称 TITLE	インターフェイス ユニット INTERFACE UNIT	
検図 CHECKED	DEC. 17. 90 N. SAITO	尺度 SCALE	1/3	IF-2000 IF-2500	
製図 DRAWN	Dec. 14. 90 S. Nishii	重量 WEIGHT	1.5 kg	図番 DWG.NO.	C4342-G01-D

## インターフェイスユニット INTERFACE UNIT IF-2000



注 1 : ケーブルクランプでアースに落とす。  
2 : ケーブルはすべて現地手配。

NOTE 1: Ground to the chassis with cable clamp.  
2: Supply the cables locally.

品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS
承認 APPROVED	DEC. 18. '90 T. WAKANO	三角法 THIRD ANGLE PROJECTION	名称 TITLE	インターフェイスユニット IF-2000	
検図 CHECKED	DEC. 18. '90 N. SAITO	尺度 SCALE		INTERFACE UNIT	
製図 DRAWN	Dec. 18. '90 S. Nishizaki	重量 WEIGHT	kg	図番 DWG.NO.	C 4 3 4 2 - C 0 1 - A

## REVISION RECORD OF OPERATOR'S/INSTALLATION MANUAL