# MOTION SENSOR MS-100
# INSTALLATION INSTRUCTIONS

## 1. GENERAL

The MS-100 measures ship's rolling and pitching angles with sensors using the principles of the gyroscope. Following in the footsteps of its predecessor model BS-704, the MS-100 is free from errors caused by ship's vertical and horizontal motions and can be installed at any convenient location.

However ship's semi-permanent inclination due to loading imbalance, etc. can not be detected and should be compensated at installation as described in these instructions.

## 2. REMARKS ON INSTALLATION

### 2.1. Installation Site

Basically, the unit can be installed at any location, provided that the following places are avoided. Especially pay attention to vibration, which may be the main cause of erroneous reading. The recommended place is on the floor in the bridge.

① Place subjected to intense vibration; engine room, thin bulkhead, ceiling, etc.

② Place exposed to rain and splash

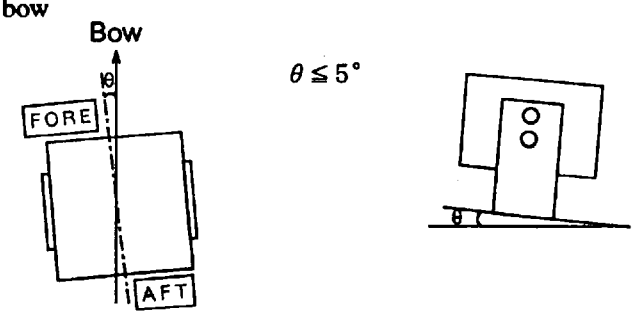
③ Place with high temperature (50 °C or more)

Further, do not mount it on the hull unit, where intense vibration is expected.

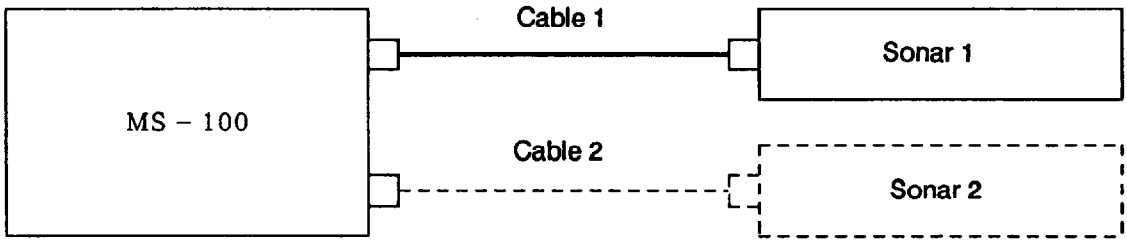
In the CSH-5, it may be unavoidable that the MS-100 is installed in the engine room since it is connected to the transceiver unit. Select a location where the vibration is minimal.

### 2.2. Installation

Orient the FORE mark on the unit toward the ship's bow and mount the unit level to within 5° in all directions.




### 2.3. Connection




*Note: Cable 2 is optional; type S06-6-10 (5-5P), code no. 006-591-760.*

PUB.NO.IME-12780-E
(9409,KAKI) MS-100

The sonar models, unit names and connector numbers to which the MS-100 is connected are as follows:

| Model | Unit (Type) | Connector No. |
|---|---|---|
| CH-14/16 | Display Unit (CH-140/160) | CN-6 [MOTION SENSOR] *1 |
| CH-18 | Display Unit (CH-180) | [MOTION SENSOR] *1 |
| CH-24/26 | Display Unit (CH-240/260) | CN-6 [MOTION SENSOR] *1 |
| CH-32 | Display Unit (CH-320) | CN-6 [MOTION SENSOR] |
| CSH-5 | Transceiver Unit (CSH-5030) | CN-B3 *2 |
| CH-34/36 | Display Unit (CH-340/360) | CN-2 [MOTION SENSOR] |

*1 The sticker "CLINOMETER" has been used in earlier sets instead of "MOTION SENSOR".

*2 Replacement of ROMs in display and transceiver units is required in the sets produced before Spetember 1990.

### 2.4 Turning on Stabilizer Function in Sonar (DIP Switch Setting)

| Model | Board | DIP Switch No. | Setting |
|---|---|---|---|
| CH-14/16 | 06P0131 | S2-7 | ON |
| CH-18 | 06P0161 | S1-2 | OFF |
| CH-24/26 | 06P0139 | S2-7 | ON |
| CH-32 | 06P0170 | S2-8 | ON |
| CH-34/36 | Menu | | ON |

1 In the CH-14/16/24/26, set the switch to "ON" when the MS-100 is connected and to "OFF" when unconnected.

2 In the CH-18 (CH-32/34/36), the switch is set to "OFF" ("ON") at the factory; the stabilizer function is turned on automatically if the MS-100 is connected. It is unnecessary to set the switch to "ON" ("OFF") when it is unconnected.

## 3. OPERATION CHECK

Operate the sonar in the self test mode. (To enable the self-test mode, turn on the sonar while pressing and holding down the test start switch. Refer to the table below.) Confirm that the clinometer reading on the screen changes according to ship's rolling and pitching.

| Model | Test Start Switch | PC Board | ROLL Pot. | PITCH Pot. |
|---|---|---|---|---|
| CH-14/16 | MODE | 06P0131 | R81 | R80 |
| CH-18 | GAIN [+] | 06P0161 | R4 | R3 |
| CH-24/26 | MODE | 06P0139 | R81 | R80 |
| CH-32 | R/B | 06P0170 | R105 | R110 |
| CH-34/36 | EVENT *1 | 06P0201 | R9 | R12 |

*1 Turn on the sonar while pressing the EVENT key and keep the EVENT key pressed until beep is heard.

NOTE

It takes about one minute until the motion sensor works after turning on the power, i.e., the reading on the screen is fixed at 0° even if the motion sensor is inclined for the first one minute.

## 4. ADJUSTMENT

When the ship has a semi-permanent inclination (trim and heel), offset it as follows. Note that the CSH-5 can not perform this adjustment.

1 By using the clinometer on the ship or by other means, measure ship's semi-permanent inclination angle. Take the polarity of the angle as follows:

| | | |
|---|---|---|
| ROLL | starboard up: +, | starboard down: – |
| PITCH | stern up: +, | stern down: – |

2 Operate the sonar in the self-check mode.

3 The ROLL and PITCH angles of the motion sensor are displayed on the screen. Adjust the ROLL/PITCH potentiometers in the display unit so that these angles agree with the angles measured at step 1 .

## 5. OTHERS

The printed circuit board in the MS-100 incorporates potentiometers and a DIP switch. Do not change their settings. The factory setting of the DIP switch is "ON" for #2 and "OFF" for #11/#3/#4.

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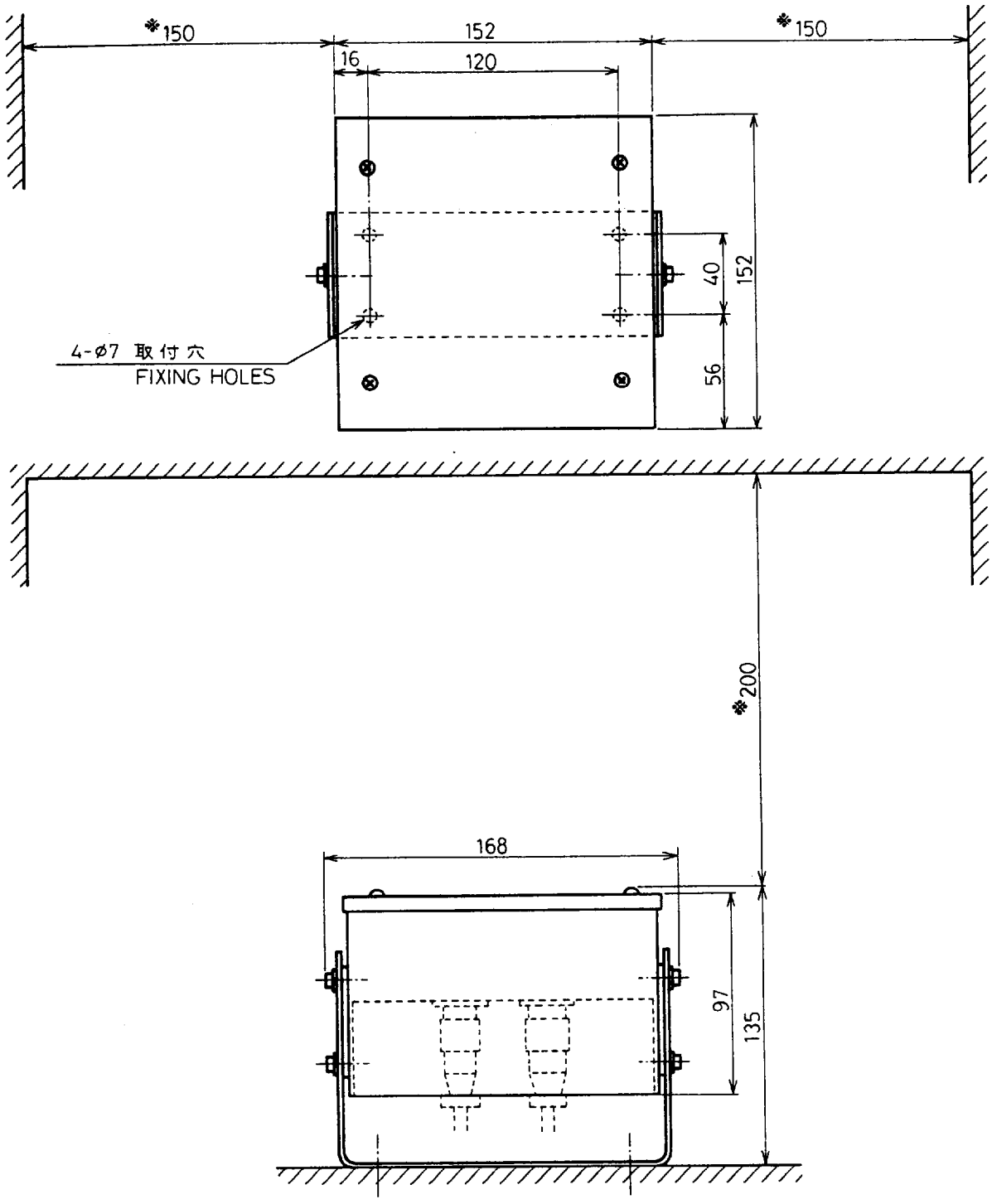


NOTE 1. 保守点検及び放熱用として ※印のスペースをとること。
DIMENSIONS MARKED "※" SHOW RECOMMENDED MAINTENANCE AND VENTILATION SPACE.
2. 船首マーク FORE を船首方向に向けて、筐体が水平になるように取り付けること。
ORIENT THE FORE MARK ON THE UNIT TOWARD SHIP'S BOW AND MOUNT THE UNIT LEVEL.

| 品番 ITEM | 品名 NAME | 材質 MATERIAL | 数量 Q'TY | 図番 DWG.NO. | 摘要 REMARKS |
|---|---|---|---|---|---|
| | | | | | |

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|---|---|---|---|---|---|
| 承認 APPROVED | JUL・20・'90 T.NAKANO | 三角法 THIRD ANGLE PROJECTION | | 名称 TITLE | 動揺検出器 |
| 検図 CHECKED | Jul・20・'90 T.KODA | 尺度 SCALE | / | MS-100 | MOTION SENSOR |
| 製図 DRAWN | JUL・20・'90 M.USUDA | 重量 WEIGHT | 2 kg | 図番 DWG.NO. | C1278-G01-A |

FURUNO ELECTRIC CO., LTD.