

# Specification

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LASER DOCKING RANGER

# SRD-303i

Aug. 02, 2004

**KODEN**

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# 1. Outline

The SRD-303i Laser Docking Ranger is an aid for safety berthing operation of oil tankers and bulk carriers by giving information of accurate distance and speed display using laser beam radiation.

The optical laser beam pulses are radiated by the laser sensor installed on the berth. When the pulses are reflected by the ship and returned to the laser sensor, its time delay is measured for calculating laser travel distance. Both the distance to the ship from berth line and the ship's approaching speed are displayed on the indicator panels installed on the berth. The SRD-303i laser beam ranging features the highly accurate and reliable measurement when compared with the conventional models.

In addition, the SRD-303i uses a color LCD screen for visible berthing information display and easy function key operations.

All of the berthing information (such as ship's name, berthing date and time, distance, speed and angle) can be saved on a floppy disk, and it can be reused for further reference and task management.

## 2. Specifications

### 2.1 Measurement Data

Ship's bow and stern distance to the berth, and their approaching speed and angle

### 2.2 Measuring System

The delayed time measurement of short-pulse, near infrared laser beams (0.85-micrometer wavelength) reflected by the ship

### 2.3 Measuring Range

Distance : 1 to 200 m

Incoming angle of ship's side line to berth line : Within  $\pm 15^\circ$

### 2.4 Accuracy

Distance : Within  $\pm 1$  m

Speed : Within  $\pm 1$  cm/sec

### 2.5 Display Items (Measuring Indicator)

Distance : 3 digits in meters (ranging from -1 to 199 m)

Speed : 2 digits in cm/sec (ranging from -99 to +99 cm/sec)

Date and time : yyyy-mm-dd, hh-mm-ss

Display interval : 1 to 9 sec by user setup (The display data is updated in this interval.)

Display modes : Numerical data display, list display, symbol display, or graphics display (selectable)

## 2.6 Information on Outdoor Indicator and Light Board Display

Distance : 3 digits in meters (ranging from -1 to 199 m)  
Speed : 2 digits in cm/sec (ranging from -99 to 99 cm/sec)

## 2.7 Print out

Print data:

Printout of measurement data

Distance, speed, angle, date, time, and ship's name (No data is printed during mooring.)

Print interval:

Can be set in each second by the user (1 – 99 seconds).

Size of print forms:

Size-A4 forms

## 2.8 Off-berth Alarm

Alarm setup range : 0.1 to 9.9 m (in each 10 cm) by user setup

## 2.9 Speed Alarm

Alarm setup range : 1 to 99 cm/sec (in each 1 cm/sec) by user setup

## 2.10 Tilt Angle Alarm

Alarm setup range : 1 to 90 degrees (in each 1 degree) by user setup

## 2.11 Power Supply

120 VAC, 1-phase, 50/60 Hz, approximately 300 VA (Measuring indicator)

240 VAC, 1-phase, 50/60 Hz, approximately 1.7k VA (Light Board Display)

## 2.12 Structure

Measuring indicator : Non-explosion proof, Foxboro Type console

Laser sensor : Explosion-proof unit (IEC79 Exd II B T5 IP65)

Outdoor indicator : Explosion-proof cabinet (IEC79 Exd II B T5X IP65)

Light Board Display : Explosion-proof pressurized Type (IEC79 Exp II B T4 IP65)

Control Box : Explosion-proof unit (JIS d2G4 equivalent to IP42)

Signal Lamp : Explosion-proof unit (IEC79 Exde II C T3 IP66)

### **2.13 Operating Temperature and Humidity Range**

Measuring indicator	: +5 to +40°C, 80% or less
Laser sensor	: -10 to +50°C, 95% or less
Outdoor indicator	: -10 to +50°C, 95% or less
Light Board Display	: -10 to +40°C, 85% or less
Control Box	: -10 to +40°C, 85% or less

### **2.14 Cabinet Surface Painting**

Measuring indicator	: 19" console 7.5BG6/1.5 salt-resistant painting
Laser sensor	: 7.5BG6/1.5 salt-resistant painting
Outdoor indicator	: 7.5BG6/1.5 salt-resistant painting
Light Board Display	: Front = N2, Other = 7.5 BG 6/1.5, salt-resistant painting
Control Box	: 7.5BG6/1.5 salt-resistant painting

### **2.15 Weight**

Measuring indicator (including PC)	: Approx. 180 kg
Laser sensor	: Approx. 45 kg/unit
Outdoor indicator	: Approx. 16 kg/unit
Light Board Display	: Approx. 1000 kg
Control Box	: Approx. 400 kg

### 3. System Configuration

#### 3.1 System Component List

Component name	Specifications	Quantity
1. Measuring indicator	SRD-303i indoor rack mount (Foxboro Type Console) Display (15" Color LCD) CPU (TOSHIBA) Full keyboard (101 type) Hard disk (2GB) Floppy disk drives (3.5"×1) Sensor control Power control Printer Connecting cables	1 unit
2. Laser sensor	Explosion-proof cabinet (IEC79 Exd II B T5) with a cover	2 units
3. Outdoor indicator	Explosion-proof cabinet (IEC79 Exd II B T5X) with a cover	2 units
4. Light board display	Flame-proof enclosure (IEC79 Exp II B T4)	1 unit
5. Control box	Explosion-proof cabinet (JIS d2G4)	1 unit
6. Laser sensor cable	8-core composite cable (I-4212)	2 cables
7. Outdoor indicator cable	8-core composite cable (I-4212)	2 cables
8. Light Board Display cable	14-core composite cable	1 cable
9. Power cord	CVV-3.5×3.3 m long	1 cable
10. Spare parts	See the attached Spare Parts List.	1 set
11. Installation materials		1 set

#### Spare Parts List

No.	Name	Specifications	Quantity
1	Fuse midget	F-7142-2A	2 (1 / sensor)
2	Printing paper	A4	500
3	Ink cartridge	(depending on printer type)	1
4	Silica gel	10 g	20 (10 / sensor)
5	Silicon grease	H10AC-G	1
6	Floppy disk	2HD	2

### 3.2 System Configuration Chart

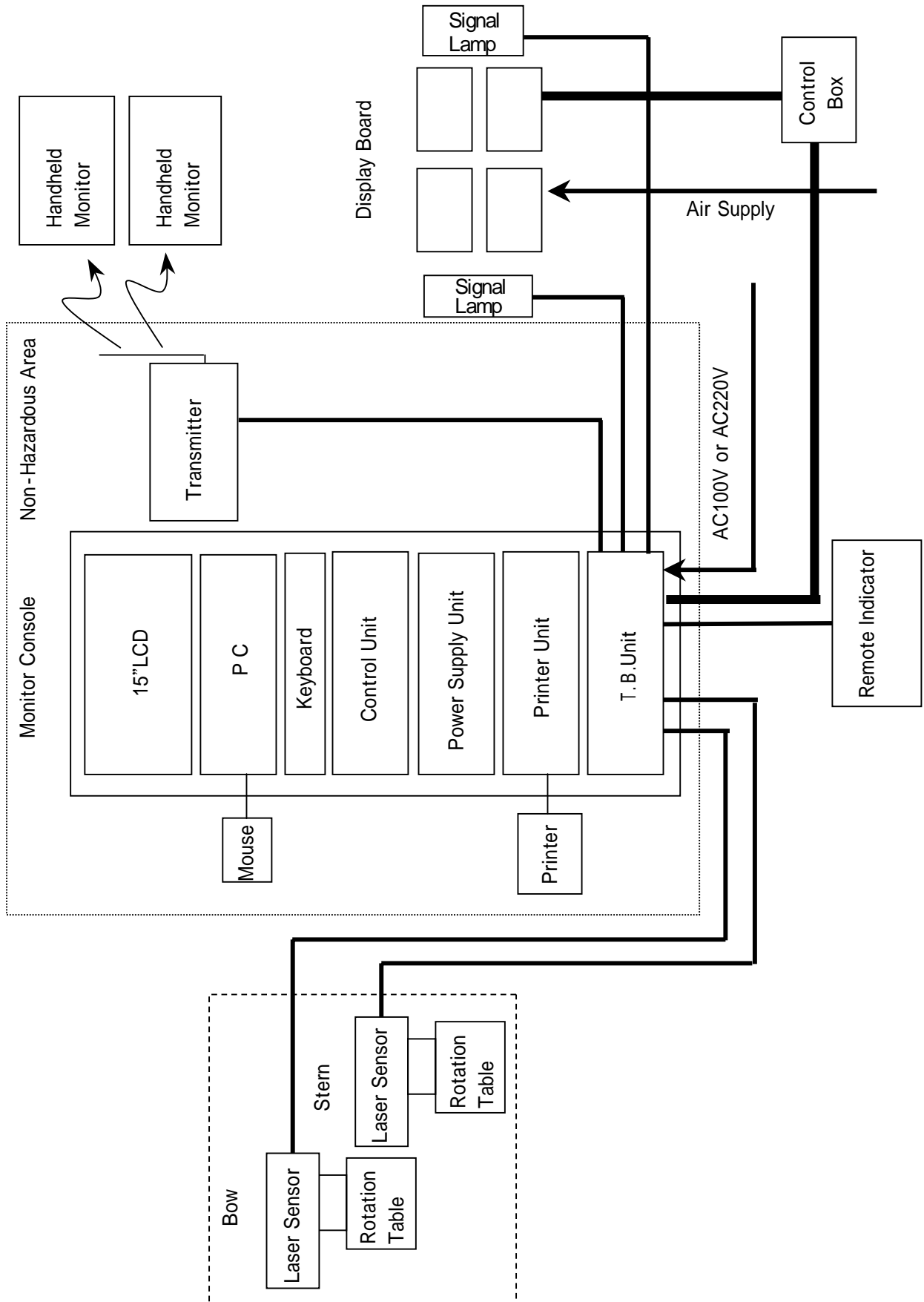


Figure 3-1 System Configuration

#### 4. Dimensional Outline Drawing

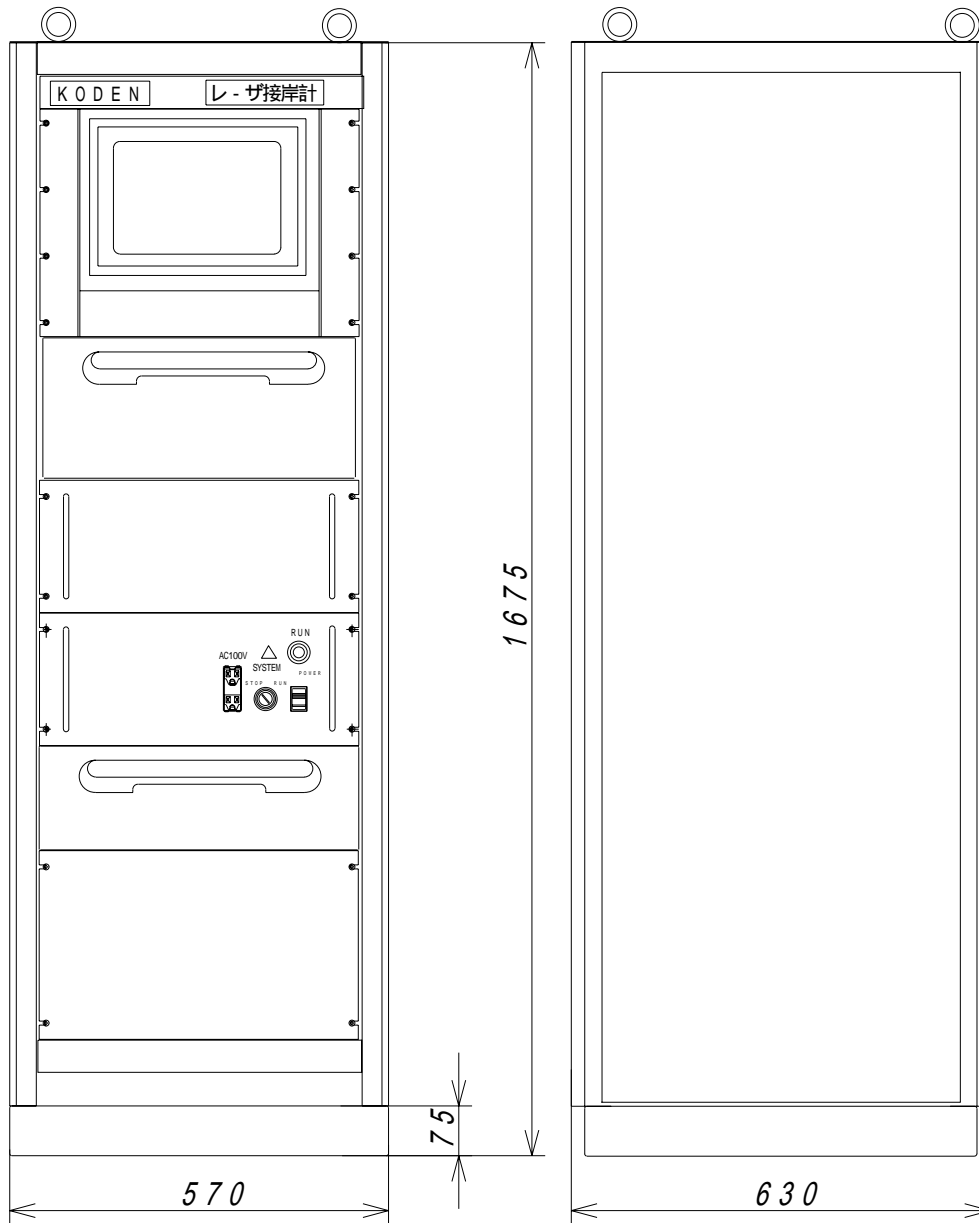


Figure 4-1 Layout of Measuring Indicator Cabinet



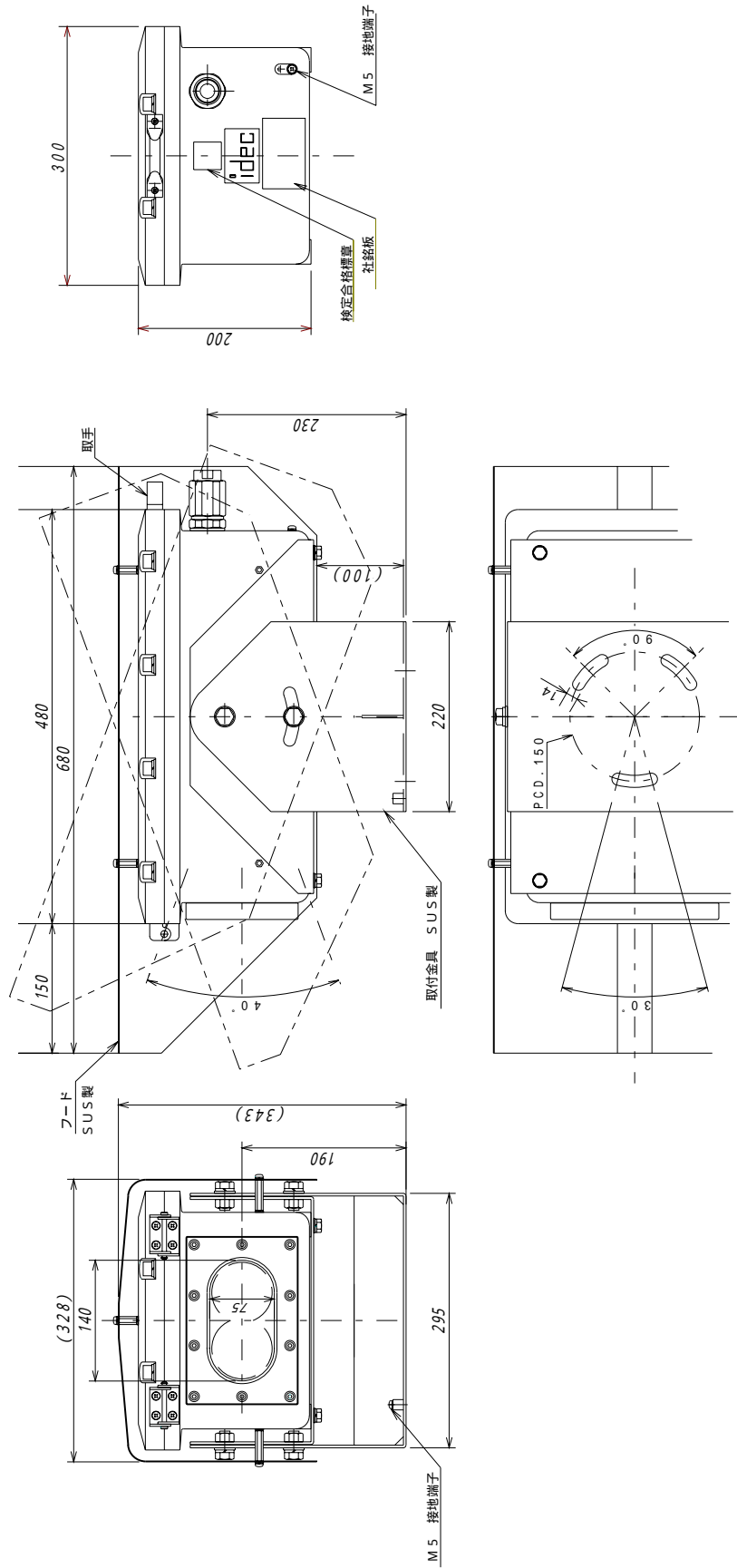


Figure 4-2 Layout of Laser Sensor

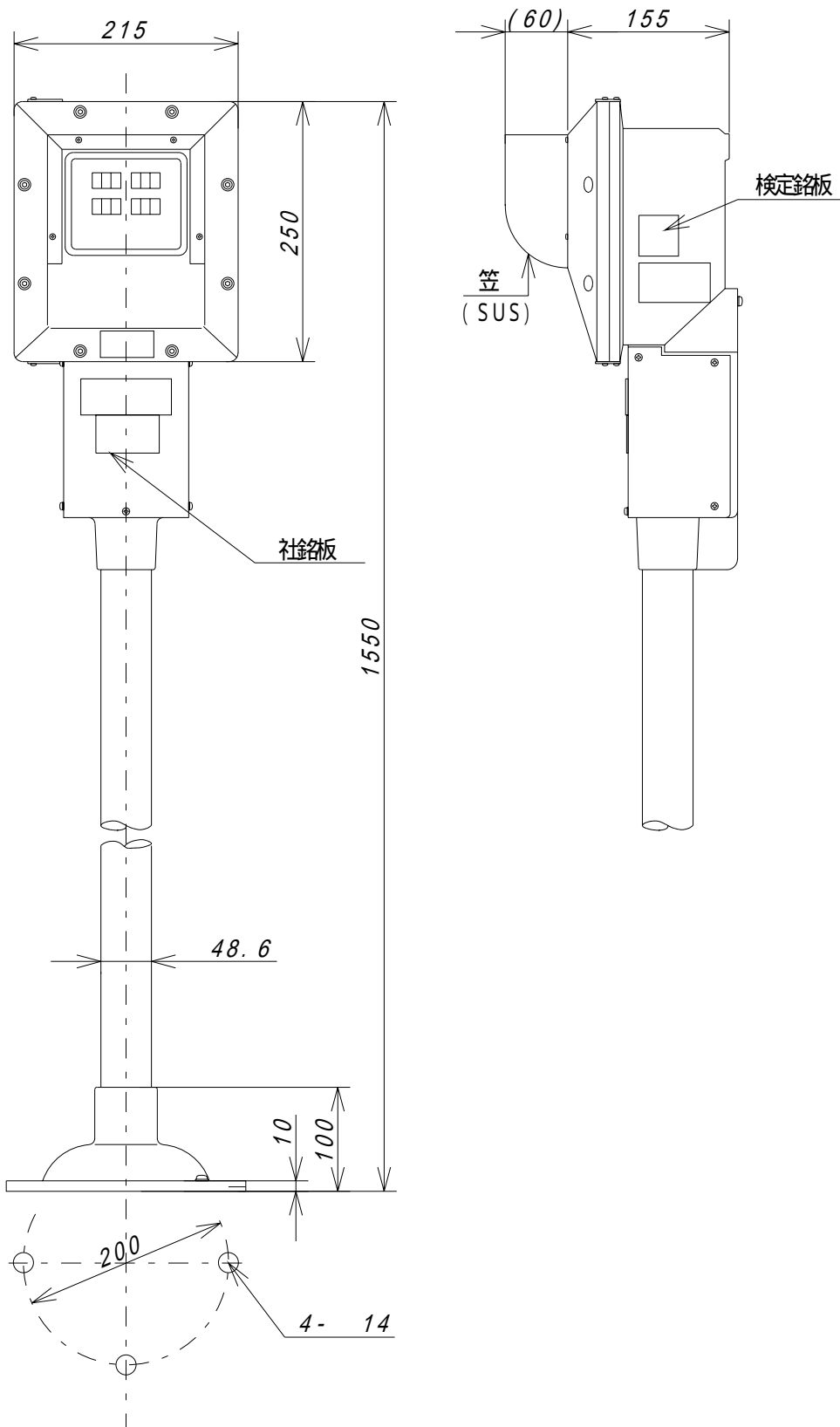


Figure 4-3 Layout of Outdoor Indicator

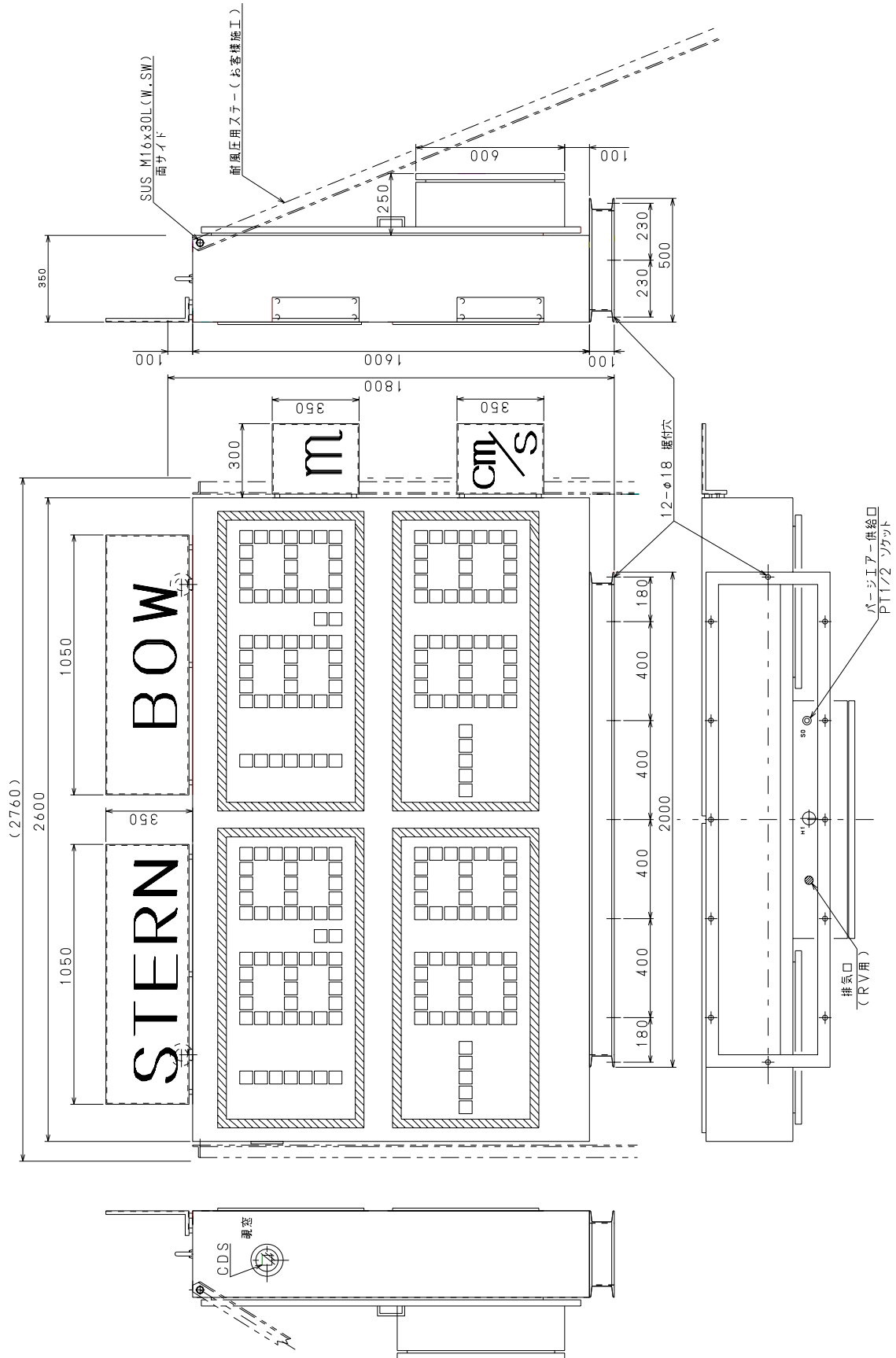


Figure 4-4 Layout of Light Board Display