Anemometer AM706

Operation & Installation Manual

NINGLU

Contents

System description

Anemometer AM706 is a combined instrument for relative wind speed (accuracy ±5%) and relative wind direction (display accuracy 10 °, output accuracy ± 1 °). With inputting GPS (RMC) data, users can print out latitude and longitude information together with wind speed and direction.

CCR alarm and deck alarm automatically give warnings when wind speed exceeds the setting value.

The **AM706** is consisted of 3 parts: Main unit, Sensor unit, Alarm units.

Main unit

The main unit **AM706C** receives the signal from the sensor unit, and displays:

➢   Relative wind direction

➢   Relative wind speed

➢   Maximum wind speed

➢   First and second level alarm settings

The main unit also output the setting of the wind speed alarm to the alarm unit.

AM706C

Sensor unit

The Sensor unit **AM706S** includes three parts:

➢   Wind speed sensor: a rotor with three wind cups.

➢   Wind direction sensor:

  a wind vane to drive an absolute angle sensor unit.

➢   Junction box

It has a waterproof junction box and a sensor unit transmitter.

AM706S

System description

Alarm unit

AM706A1 is installed in the CCR (cargo control room).

Light source: LEDs

Light form: flash

Light color: red

Sound source: buzzer

Sound form: continues

Sound decibel: 60dB～85dB(A)

AM706A1

AM706A2 is installed on the cargo deck

Light source: Super bright LEDs

Light form: rotating flash

Light color: red

Sound source: horn

Sound form: continues

Sound decibel: 110dB (A)

AM706A2

Peripheral equipment

Printer: DPU414, print date, wind speed & direction and so on

Repeater: IR761, redisplay the wind speed & direction

VDR: (vessel data recorder): record data from the main unit

GPS: input position signal to the main unit.

System description

Printer

Operating temperature:	0 ～ 40℃
Humidity:	30 ～ 80% RH
Weight:	580 g
Power:	AC220/110V with adaptor
Current:	2A (Max)
Lifetime:	500 thousand bite
Printed mode:	thermal serial dot-matrix
Thermal record paper:	CX-050B a roll of paper =30m 10 rolls/group
Interface:	8 bite parallel /RS-232C serial

Printed paper/content width: 112 mm/89.6 mm

DPU414

Repeater

Operating temperature:	0 ～ 40℃
Humidity:	10 ～ 90% RH
Weight:	1.4kg
Protection:	IP 23
Power:	DC24V
Consumption:	2W (24V)
Compass safe distance:	85 cm

IR761

System specification

Physical

Operating temperature:

Main unit	-15°C～+55°C
Sensor unit	-15°C～+70°C
Alarm unit	-15°C～+55°C

Storage temperature:

Main unit	-20°C～+70°C
Sensor unit	-20°C～+85°C
Alarm unit	-20°C～+70°C

Humidity:

Main unit	10%-90% relative humidity
Sensor unit	10%-100% relative humidity
Alarm unit	10%-100% relative humidity

IP degree

Main unit	IP 22
Sensor unit：	IP 56
Alarm unit:	AM706A1: IP 54
	AM706A2: IP 56

Weight:

Main unit	2kg
Sensor unit	10 kg
Alarm unit:	AM706A1: 0.3kg
	AM706A2: 3kg

System specification

Power

Main display power supply:	DC24V (20-32V)
Wind sensor working power:	DC9V to DC36V
Power consumption:	less than 10W (DC24V)
AC adaptor:	AC110/220V to DC24V

Measurment

The range of the wind speed:	1.2～25m/s
The range of the wind direction:	0～359°
The accuracy of the relative wind speed:	± 5% (min: 0.1m/s)
The accuracy of the relative wind direction:	display accuracy 10 °, output accuracy ± 1 °
Min start wind speed:	≤1.2m/s

Functions

Alarm:	power drops alarm, wind speed alarm
Calibration:	wind direction can be calibrated

Interface

|	
Wind sensor input:	NMEA0183-MWV
Output to alarm unit:	Switching value
Output to repeater IR761:	NMEA0183-MWV
Output to printer DPU414:	RS232C
GPS input:	NMEA0183-RMC
Direction and speed output:	4800bps

Operation

Sleep mode

Press **[▲]** and **[▼]** at the same time, turn the main unit into sleep mode.

Backlight

Press **[▲]** or **[▼]** to set backlight of the main unit.

Unit of the wind speed

Press **[S]** on the main unit to inter the "wind speed unit selection", then press **[▲]** or **[▼]** to select the speed unit. You can choose "**m/s, km/h, kts**".
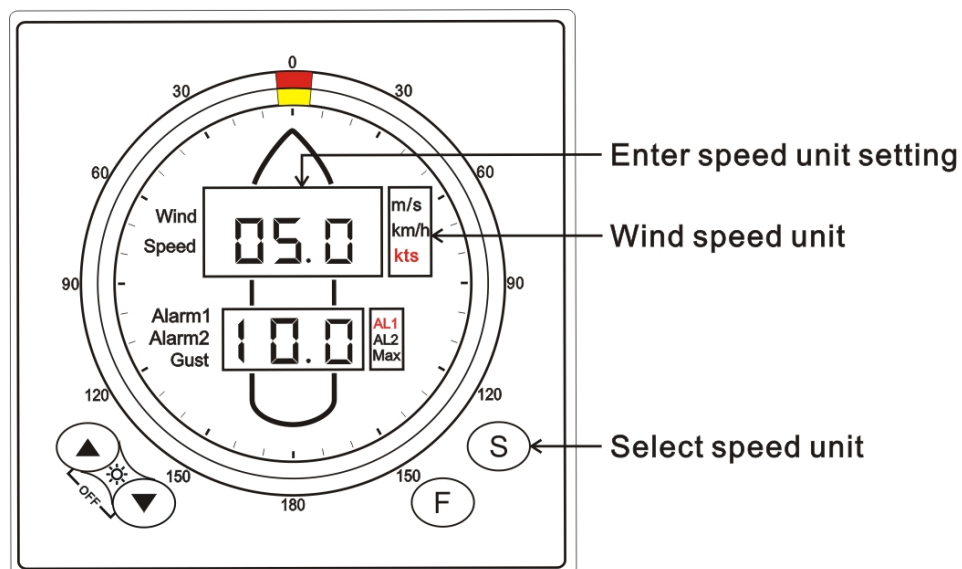
Power drops alarm

The main unit will sound an alarm when one of the power supplies drops off. Press any key on the main unit to mute the alarm.

Operation

Wind speed alarm level

There are two levels alarm. If the wind speed achieves or exceeds the first level setting, the first level alarm is triggered with 1st form of sound/light.

If the wind speed achieves or exceeds the second level setting, the second level alarm is triggered with 2nd form of sound/light.

Set the wind alarm "dividing value"

Press **[F]** once on the main unit to enter the "wind alarm dividing value setting". "**dId**" is flashing. The first line LEDs show "**dId**", then press **[▲]** or **[▼]** to set the dividing value. The second line LEDs show the setting value. The dividing value here after will be referred to as **"X".**

Set the first level alarm value

Press **[F]** twice on the main unit to enter the "1st level alarm setting". "**AL1**" is flashing. The first line LEDs show "**AL1**", then press **[▲]** or **[▼]** to set the value of the 1st level alarm. The second line LEDs show the setting value.
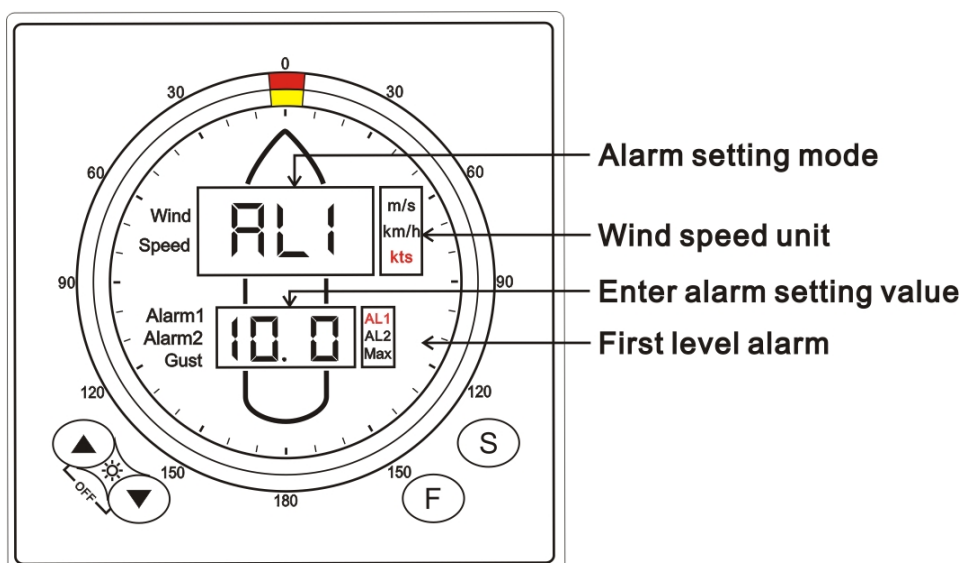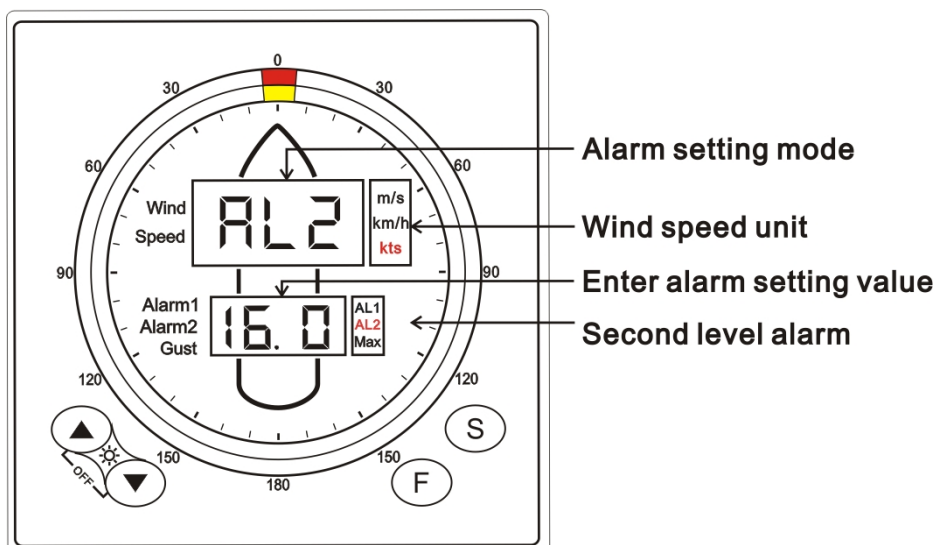
Operation

Setting range:

> **OFF**   Turn the first level alarm off
>
> **3~ "X" m/s**   Step width: 1m/s
>
> **10~ "X" km/h**   Step width: 2km/h
>
> **5~ "X" knots**   Step width: 1kn

Set the second level alarm value

Press **[F]** three times on the display to enter the "2nd level alarm setting". "**AL2**" is flashing. The first line LEDs show "**AL2**", then press **[▲]** or **[▼]** to set the value of the 2nd level alarm. The second line LEDs show the setting value.

Setting range:

> **OFF**   Turn the second level alarm off
>
> **"X+1" ~ 60 m/s**   Step width: 1m/s
>
> **"X+1" ~ 216 km/h**   Step width: 2km/h
>
> **"X+1" ~ 116 knots**   **Step width: 1knots**

Operation

Alarm

When wind speed achieves or exceeds the alarm setting value for 30 seconds, the main unit AM706C will sound an alarm and the letters in first LED line will be flashing; meanwhile, the main unit will send the alarm signal (switching value) to the alarm unit. **AM706A1** (the alarm installed in the cargo control room) and **AM706A2** (the alarm installed on the cargo deck) are sounding and flashing.

Mute the alarm

You can press any button on AM706C to mute the alarms. After muted, the alarms' lights are still flashing.

Turn off the alarm

If you want to turn the alarm off, you can press **[F]** on the main unit to inter the setting mode, and set the alarm value to "OFF".

Gust mode

Press **[F]** four times on the main unit to inter the "gust mode". "**Max**" is shining. The second line LEDs show the time interval, press **[▲]** or **[▼]** to select the interval time value. You can choose from 1 /2 /5 /10 min.
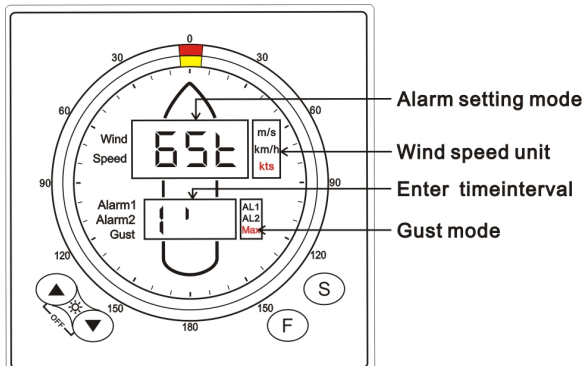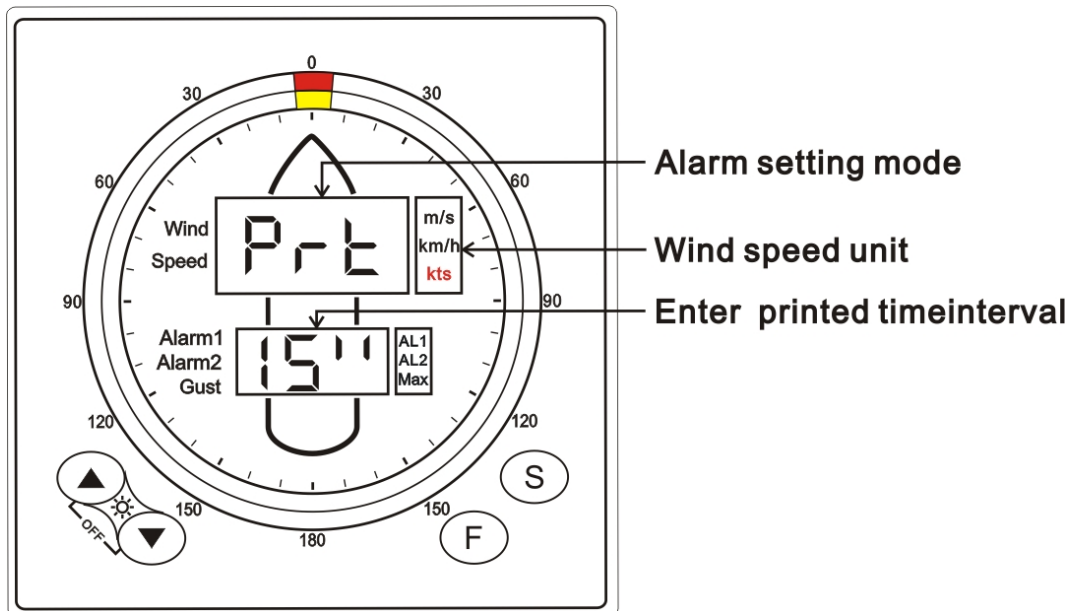
Operation

Printed time interval

The printed time interval can be adjusted.

Press **[F]** five times on the main unit to inter the "printed time interval setting mode".

The second line LEDs show the time interval, press **[▲]** or **[▼]** to select the interval time value.

You can choose from OFF/15 s/30s /60 s/5min/10min/15min/30min.

Operation

Printer setting

DPU-414 Print settings is showing as follow:

Dip SW-1

    1 (OFF):Input=Serial

    2 (ON):Printing Speed=High

    3 (ON):Auto Loading=ON

    4 (OFF):Auto LF=OFF

    5 (ON):Setting Command=Enable

    6 (OFF):Printing

    7 (ON):Density

    8 (ON):=100%

Dip SW-2

    1 (OFF):Printing Columns=80

    2 (ON):User Font Back-up=ON

    3 (ON):Character Select=Normal

    4 (ON):Zero=Normal

    5 (ON):International

    6 (ON):Character

    7 (ON):Set

    8 (OFF):=U.S.A.

Dip SW-3

    1 (ON):Data Length=8 bits

    2 (ON):Parity Setting=No

    3 (ON):Parity Condition=Odd

    4 (ON):Busy Control=H/W Busy

    5 (ON):Baud

    6 (OFF):Rate

    7 (OFF):Select

    8 (OFF):=4800 bps.

Operation

Printed Format

With GPS input, printed format is showing as follow:

```
06/12/11 15:42 28°38.7010N(S) 121°25.8340E(W) 233° 11.0 Knot(s)
```
       ①   ②   ③   ④   ⑤   ⑥

(1) Date/month/year

(2) Hour: minute

(3) North Latitude (South Latitude)

(4) East Longitude (West Longitude)

(5) Wind direction

(6) Wind speed

Without GPS input, printed format is showing as follow:

```
XX/XX/XX XX:XX XX°XX.XXXXN/S XX°XX.XXXXE/W   233° 11.0Knot(s)
```
       ①   ②   ③   ④   ⑤   ⑥

(1) Date/month/year

(2) Hour: minute

(3) North Latitude (South Latitude)

(4) East Longitude (West Longitude)

(5) Wind direction

(6) Wind speed

Operation

After setting, press **[F]** again, the display of the LEDs on the main unit come back to normal situation.

The display of the second line LEDs

There are several cases about the display of the second line LEDs at the normal situation.

1. First level alarm is off, second level alarm is off

The second line LEDs show: the max wind speed (Gust)

2. First level alarm is on, second level alarm is off

The second line LEDs show alternately: the max wind speed / the setting value of the first level alarm. The time interval is 5 seconds.

3. First level alarm is off, second level alarm is on

The second line LEDs show alternately: the max wind speed / the setting value of the second level alarm. The time interval is 5 seconds
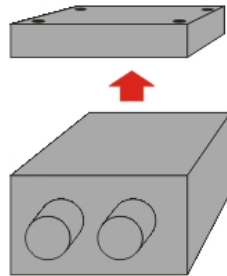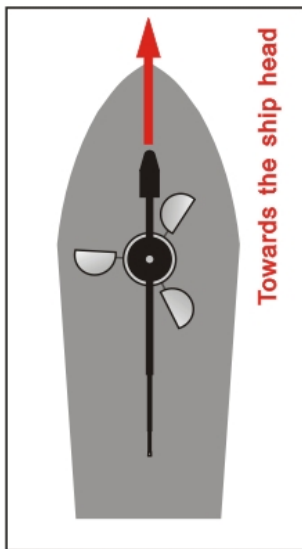
4. First level alarm is on, second level alarm is on

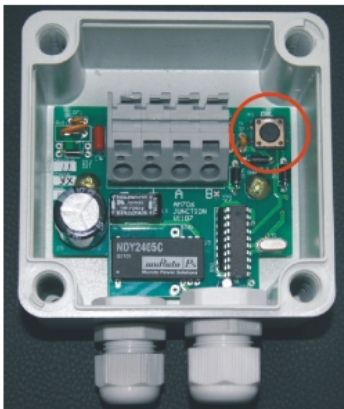The second line LEDs show alternately: the max wind speed /the setting value of the first level alarm / the setting value of the second level alarm. The time interval is 5 seconds

Calibration

Wind Direction Calibration

Towards the ship head

① Assistant goes up to hold the vane towards the ship head (Fore direction). And open the waterproof junction box.
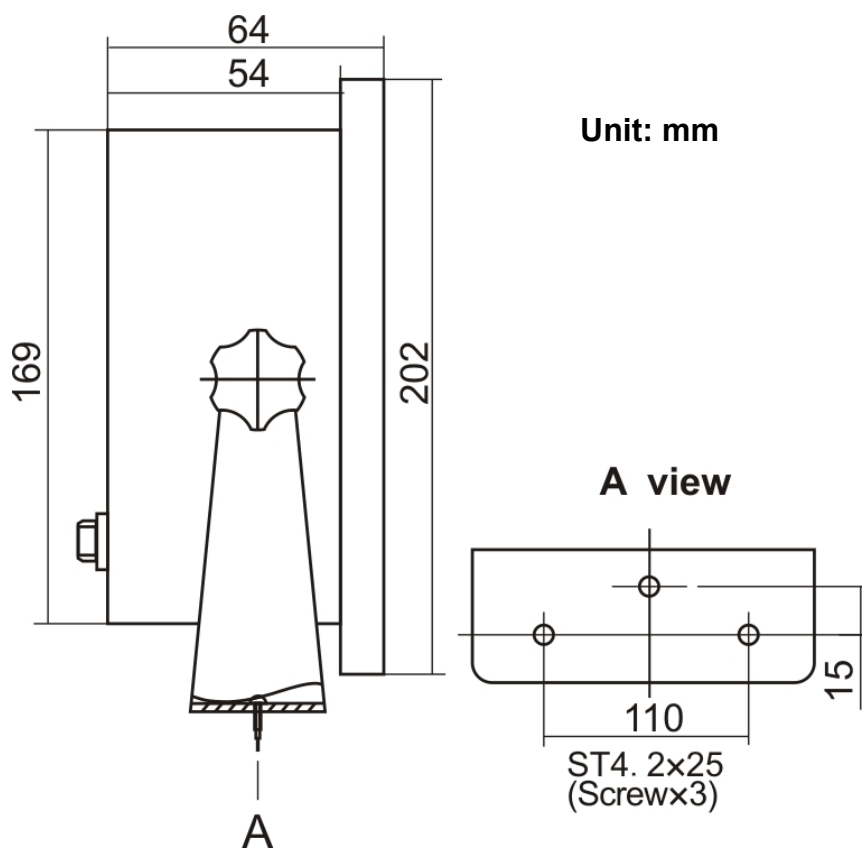
② Press button inside the waterproof junction box, the displayer shows ″000″. Close the box in the end.
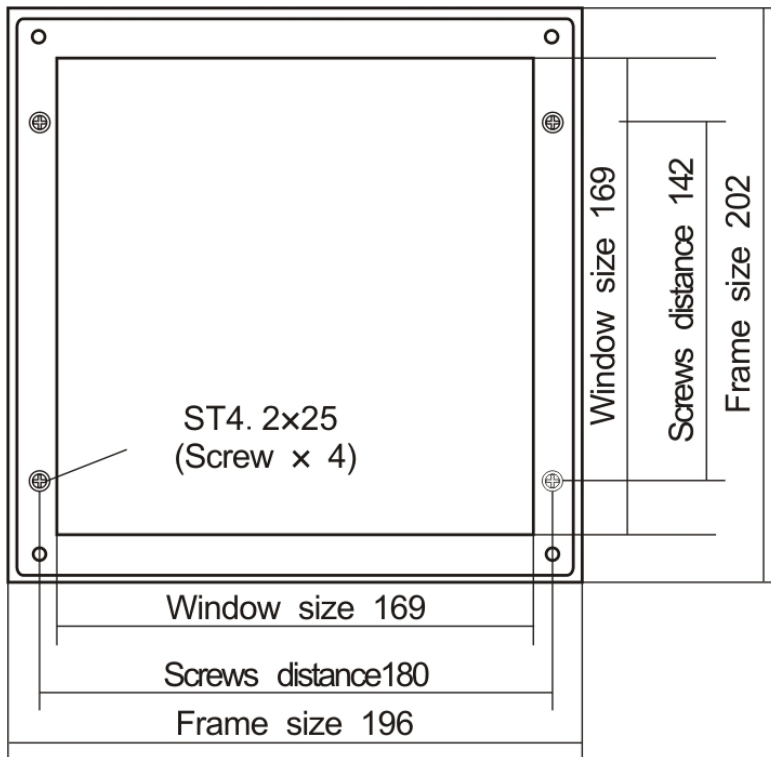
Installation

Main unit

The main unit can be table or flush mounted.

Table mounting

64

54

169

202

Unit: mm

A view

15

110

ST4. 2×25
(Screw×3)

A

Installation

Flush mounting

ST4. 2×25
(Screw × 4)

Window size 169

Window size 169

Screws distance 142

Frame size 202

Window size 169

Screws distance 180

Frame size 196

Flush mounting procedure

1. Make a cut out (169mmx169mm) in the Console.

2. Remove the mounting bracket.

3. Unscrew the 4 screws on the frame, then remove frame.

4. Put AM706C into the cut out, fix the inside 4 holes with self-tapping screws (ST4.2 × 25).

5. Finally put on the frame.

Installation

Sensor unit

Put the wind vane at the top of the bracket, install as the following order: black O-ring, flat washer, spring washer, two nuts, cotter pin. The two nuts must be screwed tightly and cotter pin locked.

Put the wind cups at the bottom of the bracket, then install as the following order: flat washer, spring washer, two nuts, cotter pin. The two nuts must be screwed tightly and cotter pin locked.
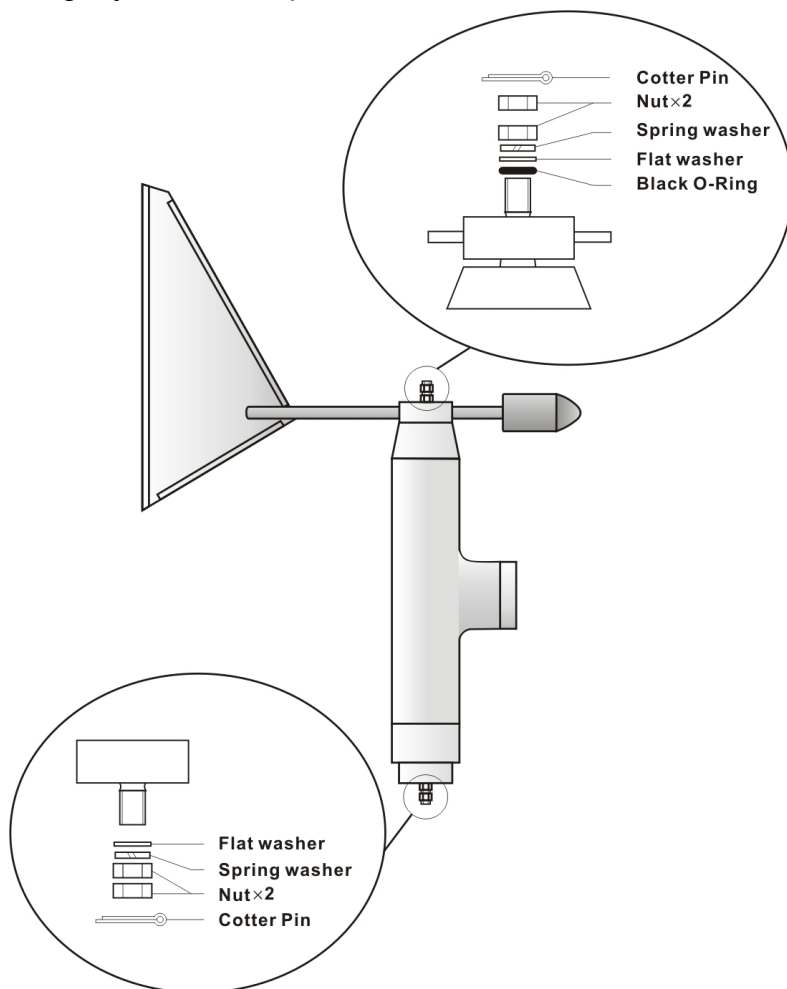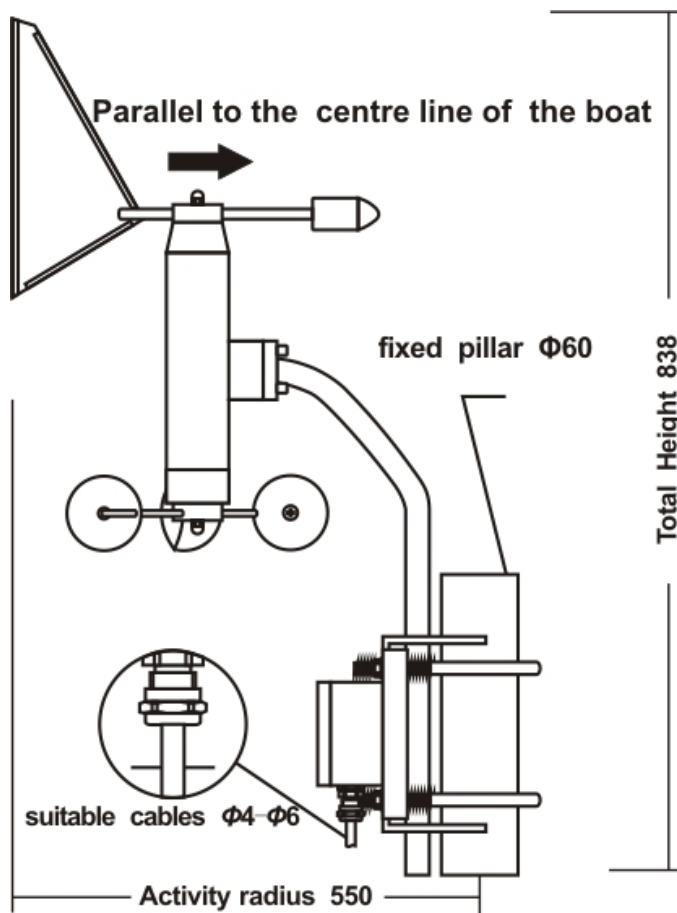
Installation

Ensure that the Sensor unit is mounted high enough to avoid any interference from obstacle.

The fixed pillar/pipe diameter should be 60mm and make sure the activity radius 550mm.

After the installation, calibration must be taken. Please refer to the "page P14" for detail.
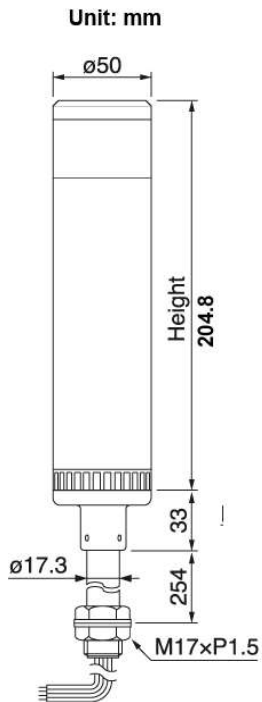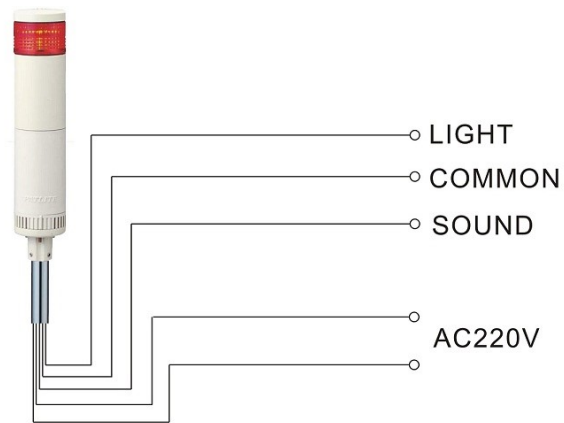
Parallel to the centre line of the boat

fixed pillar Φ60

Total Height 838

suitable cables Φ4~Φ6

Activity radius 550

Installation

Alarm unit (AM706A1)

AM706A1 can be wall mounted with bracket supplied.

Installation diagram   **Wiring diagram**

ATTENTION!

The three lines of LIGHT, COMMON, SOUND will be damaged if connected to the AC220V power supply!
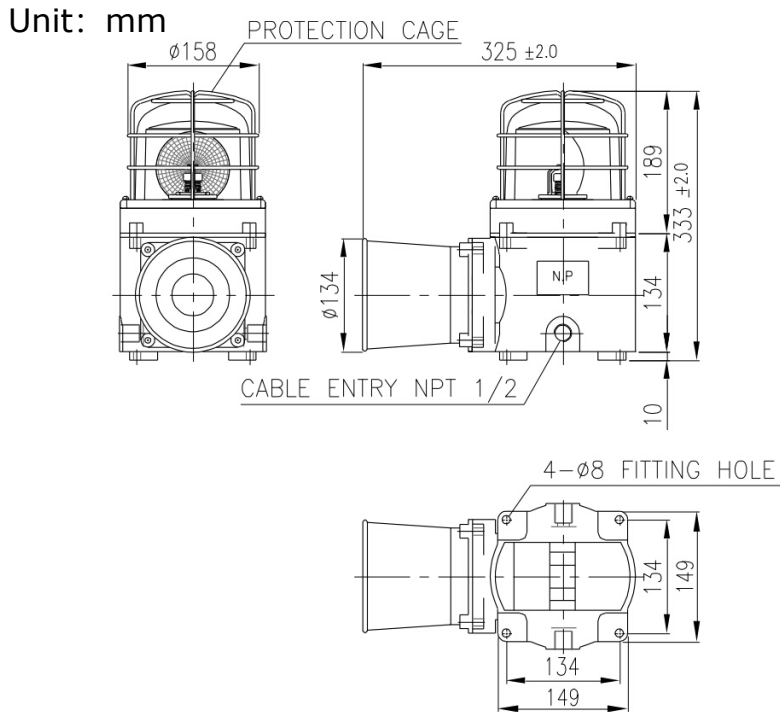
High Voltage Hazard!

High voltage is on LIGHT, COMMON, SOUND lines when alarm is connected with power.
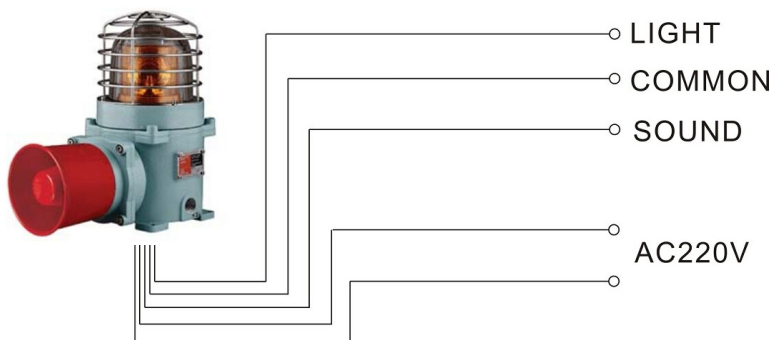
Alarm unit (AM706A2)

AM706A2 can be installed on a console, panel, on the overhead, or on the bulkhead with tapping screws.
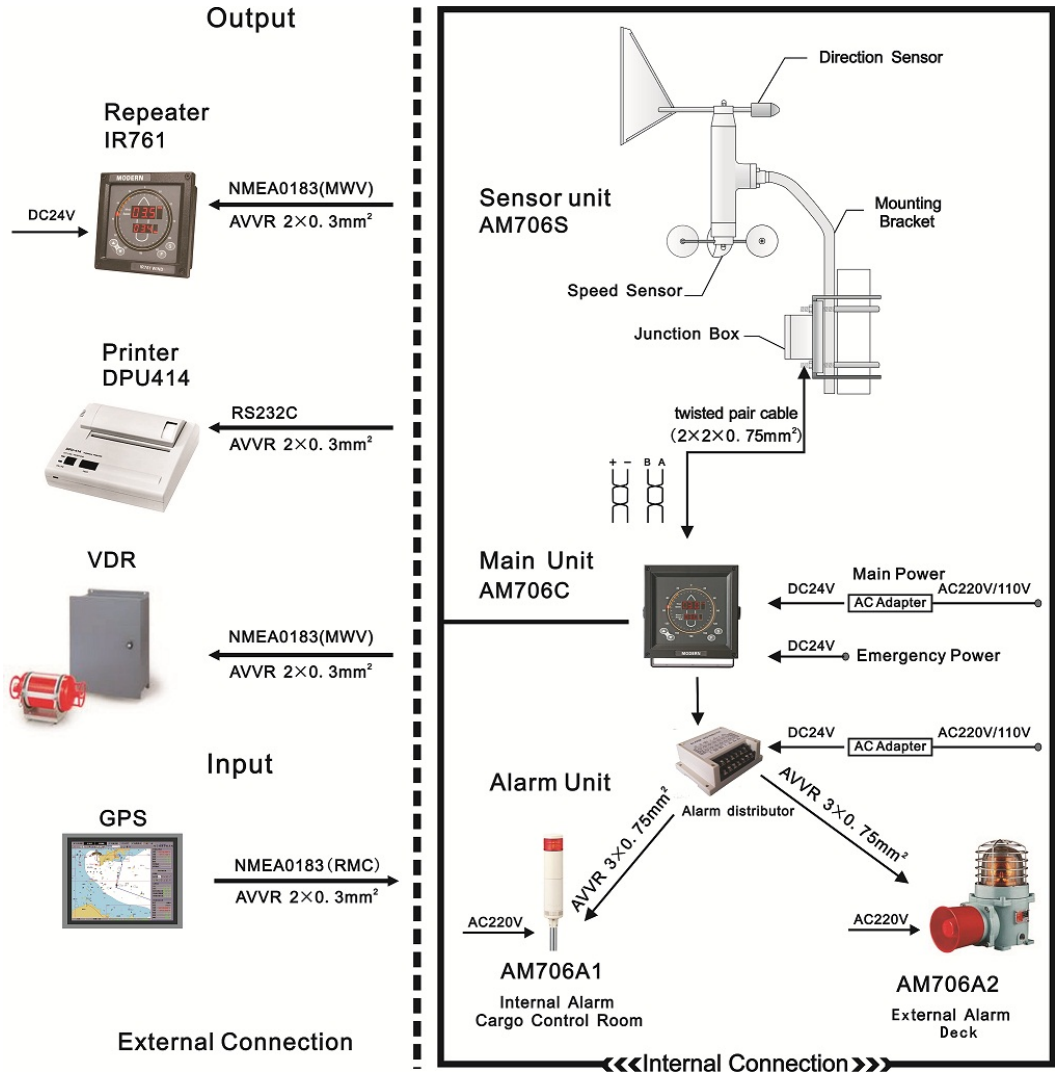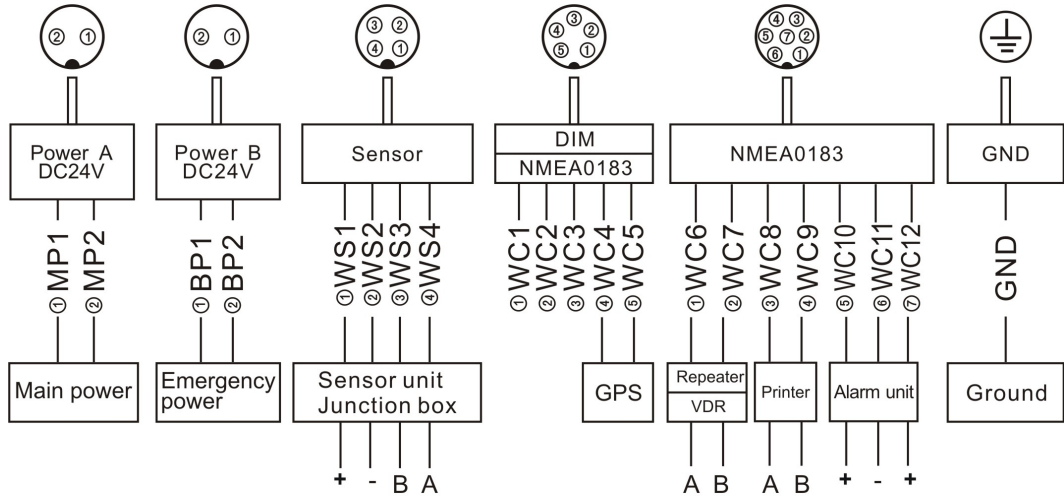
Installation diagram

Unit: mm

PROTECTION CAGE
ø158
325 ±2.0
189
333 ±2.0
ø134
134
NP
10
CABLE ENTRY NPT 1/2

4-ø8 FITTING HOLE
134
149
134
149

Wiring diagram

LIGHT
COMMON
SOUND

AC220V

System diagrams

Output

Repeater
IR761

DC24V →

NMEA0183(MWV)
AVVR 2×0. 3mm²

Printer
DPU414

RS232C
AVVR 2×0. 3mm²

VDR

NMEA0183(MWV)
AVVR 2×0. 3mm²

Input

GPS

NMEA0183（RMC）
AVVR 2×0. 3mm²

External Connection

Direction Sensor

Sensor unit
AM706S

Mounting Bracket

Speed Sensor

Junction Box

twisted pair cable
(2×2×0. 75mm²)

+ − B A

Main Unit
AM706C

Main Power
DC24V   AC220V/110V
AC Adapter

DC24V   Emergency Power

DC24V   AC220V/110V
AC Adapter

Alarm Unit

AVVR 3×0. 75mm²
AVVR 3×0. 75mm²

Alarm distributor

AC220V

AC220V

AM706A1
Internal Alarm
Cargo Control Room

AM706A2
External Alarm
Deck

《《《Internal Connection 》》》

24

Wiring diagram

Name	Content	Name	Content
MP1 (Red)	Main power +	WC1	DIM +
MP2 (Black)	Main power -	WC2	DIM -
BP1	Emergency power +	WC3	DIMKEY
BP2	Emergency power -	WC4 (Black)	NMEA0183 Input B
WS1 (Red)	Wind sensor power output+	WC5 (Red)	NMEA0183 Input A
WS2 (Black)	Wind sensor power output-	WC6 (Red)	NMEA0183 Output A to Reapter / VDR
WS3 (White)	Wind sensor data inputB	WC7 (Black)	NMEA0183 Output B to Reapter / VDR
WS4 (Blue)	Wind sensor data inputA	WC8 (Blue)	Output to print A
GND	Ground	WC9 (White)	Output to print B
		WC10 (Orange)	Output to sound alarm +
		WC11 (Green)	Output to alarm com -
		WC12 (Yellow)	Output to light alarm+

Supplementary wiring for printer DPU-414

Female RS232 of printer DPU-414
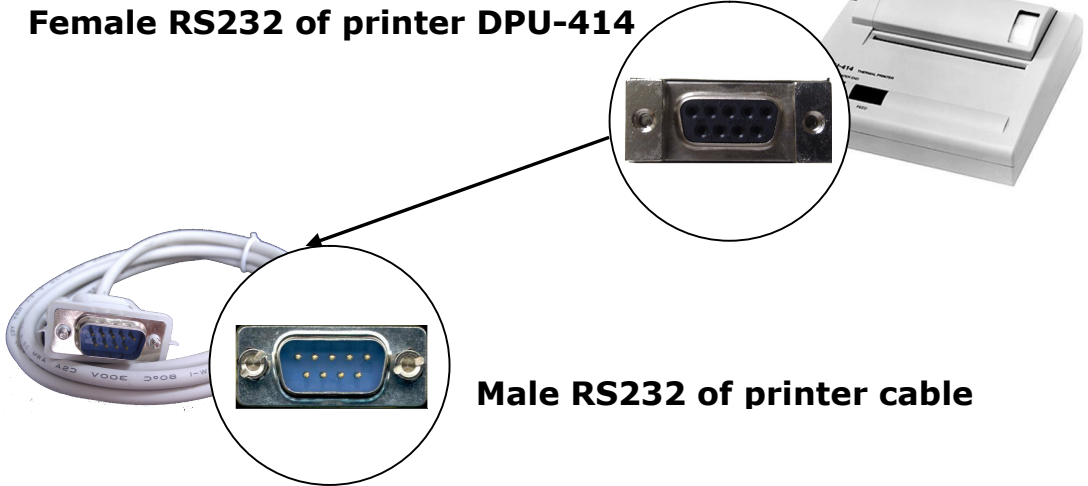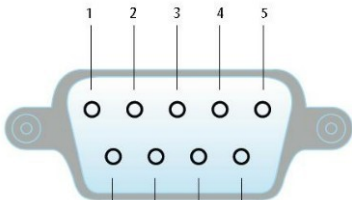
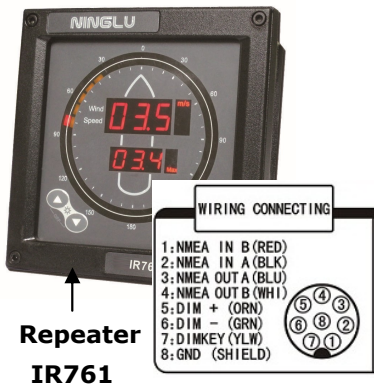

Male RS232 of printer cable

Pin 3 → Print A → ③WC8

Pin 5 → Print B → ④WC9

Male RS232 of printer cable

AM706C

Supplementary wiring for repeater IR761

WIRING CONNECTING
1:NMEA IN B(RED)
2:NMEA IN A(BLK)
3:NMEA OUT A(BLU)
4:NMEA OUT B(WHI)
5:DIM + (ORN)
6:DIM - (GRN)
7:DIMKEY(YLW)
8:GND (SHIELD)

Repeater IR761

Pin 2 → NMEA0183 A → ①WC6

Pin 1 → NMEA0183 B → ②WC7

AM706C