

**BRIDGE NAVIGATION WATCH ALARM SYSTEM
OPERATOR'S MANUAL**

MODEL: BWS-180

YANTAI TIANSHENG ELECTRONICS TECHNOLOGY CO.,LTD

TABLE OF CONTENTS

1、FOREWORD	3
2、PERFORMANCE	3
3、TECHNICAL SPECIFICATIONS	7
4、OPERATION	9
4.1 Outline View Drawings	9
4.2 “POWER SUPPLY” Setup	11
4.3 “LANGUAGE” Setup	11
4.4 “START” the system	11
4.5 “OPERATION MODE” Setup	12
4.6 “PARAMETERS” Setup	12
4.7 “MUTE”	14
4.8 “EMERGENCY CALL”	14
4.9 “SELF-TEST”	15
5、OUTPUT DATA PROTOCOL	15
6、INSTALLATION	16
6.1 Considerations and Outline Dimension	16
6.2 Compass Safe Distance	18
6.3 Installation Schematic Drawing	18
6.4 Connection Diagram	18
APPENDIX1、PACKAGE LIST	19
DRAWINGS 1、BLOCK DIAGRAM of INSTALLATION	20
DRAWINGS 2、CONNECTION DIAGRAM of INSTALLATION	21

1、FOREWORD

The purpose of BWS-180 / bridge navigation watch alarm system (BNWAS) is to monitor bridge activity and detect the operator's disability which could lead to marine accidents. The system monitors the awareness of the Officer of the Watch (OOW) and automatically alerts the Master or another qualified OOW if for any reason the OOW becomes incapable of performing the OOW's duties. This purpose is achieved by a series of indications and alarms to alert first the OOW , if he is not responding, then to alert the Master or another qualified OOW . Additionally, BWS-180 may provide the OOW with a means of calling for emergency assistance if required. The BNWAS should be operational whenever the ship's head or track control system is activated , or speed over ground (SOG) is not zero(The former takes precedence),unless be inhibited by the Master.

2、PERFORMANCE

BWS-180 / bridge navigation watch alarm system (Be called "the system" below) is designed according to IMO Resolution MSC.128(75) (Recommendation on performance standards for a bridge navigational watch alarm system), IEC62616 (Maritime Navigation and radiocommunication equipment and system-Bridge Navigational Watch Alarm System(BNWAS)), and IEC60945 (Maritime Navigation and Radiocommunication Equipment and Systems-General Requirements-Methods of Testing and Required Test results). The purpose is to monitor activity of officer of navigation duty watching, to ensure vessel's safety. The means of selecting the Operational Mode and the duration of the Dormant

Period (Td) has been security protected so that access to these controls should be restricted to the Master only.

Dormant period can be selected 3~12 minutes, referring to vessel size and actual situation.

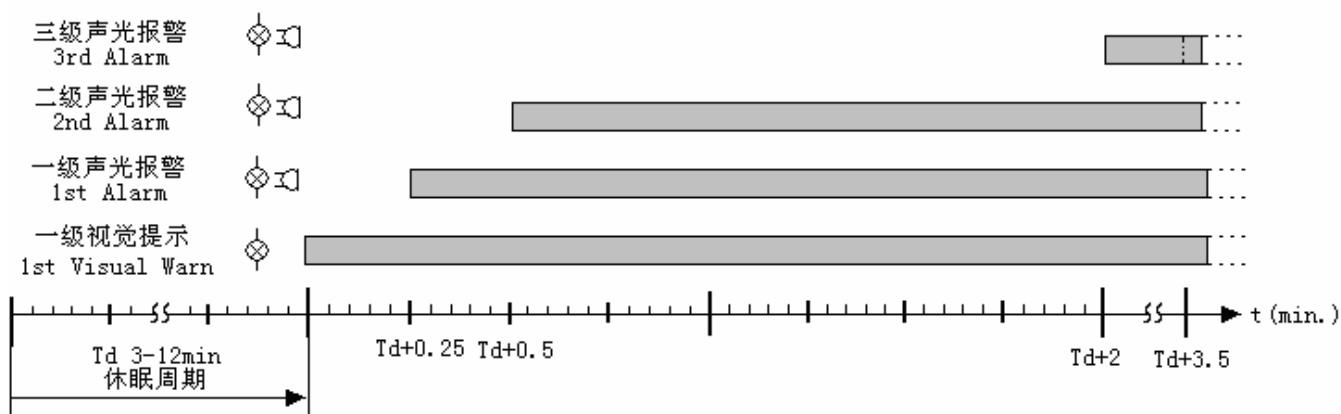
At the end of this dormant period, the system will initiates a visual warn of the first stage RESET/ALARM UNIT in the bridge.

If not reset ,the system will additionally initiates an audible alarm of the first stage RESET/ALARM UNIT in the bridge 15s after the visual warn is initiated.

If not reset, the system will additionally initiates a remote visual and audible alarm of the second stage ALARM UNIT in the back-up officer's and /or Master's room 15s after the first stage audible alarm is initiated.

If not reset, the system will additionally initiates a remote visual and audible alarm of the third stage ALARM UNIT at the location of further crew members capable of taking corrective actions 90s~180s after the second stage audible alarm is initiated. The system also can initiates the other remote alarm unit (such as "General Alarm") if it is necessary to be connected to the "ALARM OUTPUT "of the second or third stage. If the system is feeded with GPS data, it will display own vessel's Longitude / Latitude, COG, SOG.

Figure of Alarm sequence :



The reset function shall be performed by a single pressing RESET button on any first Reset/Alarm Unit, or detecting activity of the duty officer(s) in assigned area by Infrared-sensing Reset Unit, to cancel all visual and audible alarm and initiates a further dormant period. If the reset function is activated before the end of the dormant period, the period shall be re-initiated to run for its full duration from the time of the reset. **(NOTE:If the RESET button being kept pressing beyond 30s, the system will initiates a further dormant period automatically.)**

The system incorporates “Manual OFF” , “Manual ON” and “Automatic” operational modes: “Manual OFF” –The system never activates at any time; “Manua ON” –The system activates constantly; “Automatic”-The system automatically activates when the ship’s head or track control system is activated, or speed over ground (SOG) is more than 0.3kt, otherwise the system is not activated.

The system incorporates “Emergency Call ” function: it may be provided in the bridge to immediately activate the second ,and subsequently third , remote stage

visual and audible alarm by pressing “Emergency Call” button on the Main unit . This button is protected by a lip cover avoid to be mal-pressed.

The display of system is built-in 100 X 78mm LCD screen, it displays simultaneously: own vessel's Longitude / Latitude , COG, SOG , Date, UTC dormant PERIOD, TIMER, BRILLANCE & TONE of the first, second and third stage alarm unit in Chinese or English (selectable). Each brilliance can be adjusted from 0 to 9 (**When alarming, self-check and emergency call each brilliance will reach maximum value 9 automatically**), Each tone can be selected from 0 to 9.

The system is powered from the ship's main power supply AC (110V/220V selectable) and reserve power DC (24V),exchange automatically. If one of power supply is in malfunction it will initiate a visual and audible alarm on the Main Control Unit, Press MUTE button to silence it, but the visual alarm keeping until the power supply is normal.

The Main Control Unit is built-in a high performance single chip microcomputer, using data bus organized structures. Design of hardware and software is very scientific, having high timer accuracy and driving ability (Each stage can drives 1- 8 Alarm Units). There are steering engine and GPS input interfaces, when it is operated in “AUTOMATIC” mode, the system will activate or inhibit automatically according to data inputted from steering engine or GPS.

The system alarm output interface can be connected to other remote alarm, only as a switch to initiate the remote alarm.

The system also provide interfaces (one is NMEA, one is RS422) according

to IEC 61162-1, ALR sentence, supply system information to VDR or other equipments.

3. TECHNICAL SPECIFICATIONS

1. Ambient Temperature	(Complies with IEC60945)
Indoor Units	-15 ~ + 55 °C
Outdoor Units	-25 ~ + 55 °C
2. Relative Humidity	75% (at 40°C)
3. Power Supply	220 V ±10% 或 110V ±10% AC 24V (18~36V) DC
4. Power Consumption	< 50w
5. Dormant Period	3~12 min.
6. Brilliance Classes	0~9
7. Tone Sorts	0~9
8. Sound Pressure Level of First Stage	75dB≤from 1m≤85dB
9. Sound Pressure Level of Second & Third Stage	75dB≤from 1m≤120dB
10. Timer Accuracy	±5%
11. Data Rate (output)	4800 bps
12. Data Format (output)	IEC61162-1 (RS422 & NMEA)
13. Alarm Output (contactor)	< 125V/2A
14. First Stage Reset/Alarm Load Ability	≤ 8sets
15. Second Stage Alarm Load Ability	≤ 8 sets

16. Third Stage Alarm Load Ability	≤ 8 sets
17. Delay Between Second and Third Alarm	90~180s
18. Software Version	BWS-180V1. 0
17. GPS Data Format (input)	RMC, GLL, GGA, VTG
19. "Automatic" Mode Activate Speed	≥0.3kt
20. IP Standard	
Indoor Units	IP20
Outdoor Units	IP56
21. Main Control Unit Size	400×300×110 mm
22. Main Control Unit Weight	2.2 kg

4、OPERATION

4. 1 Outline View Drawings

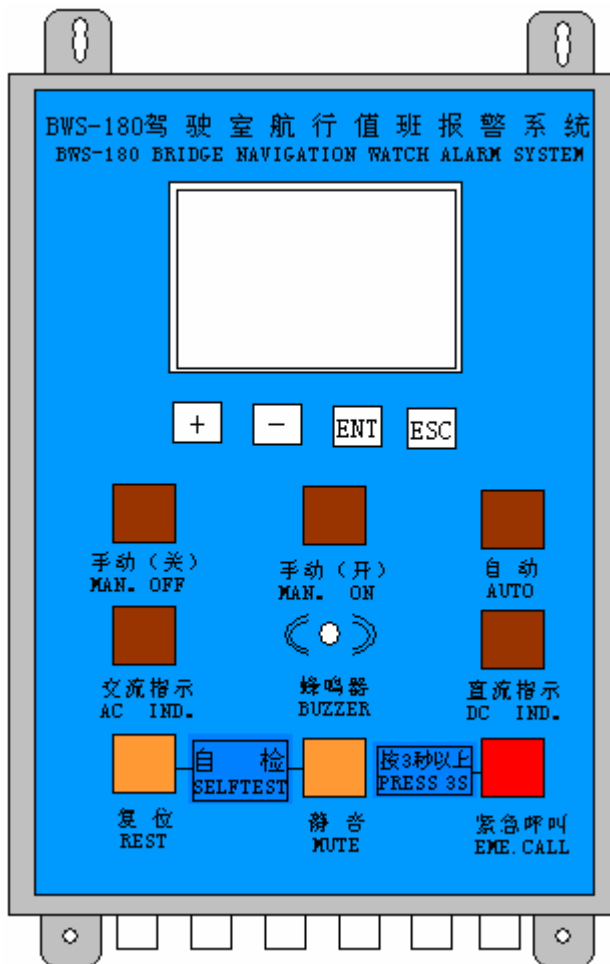


Fig.1 Main Control Unit (outside)

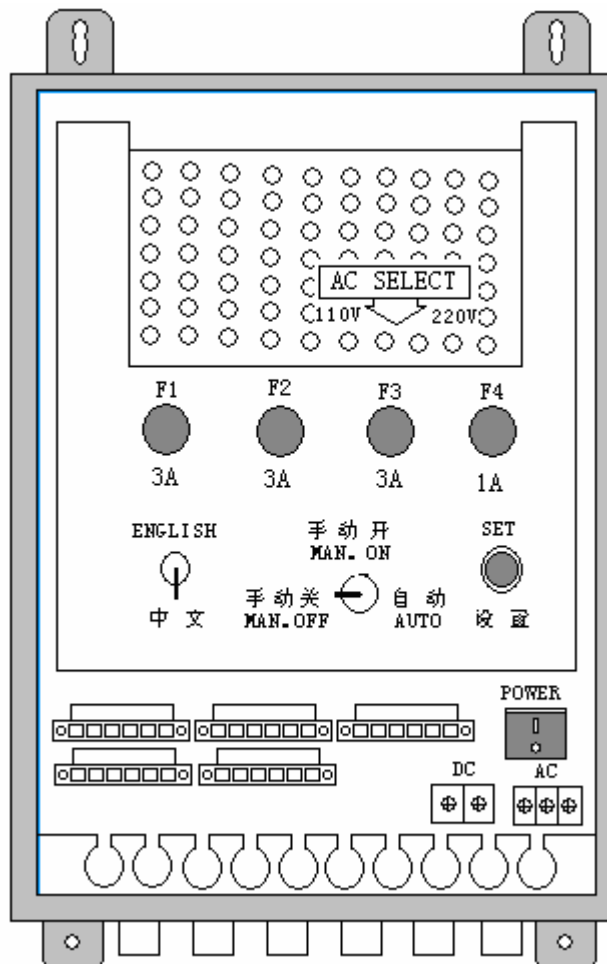


Fig.2 Main Control Unit (inside)

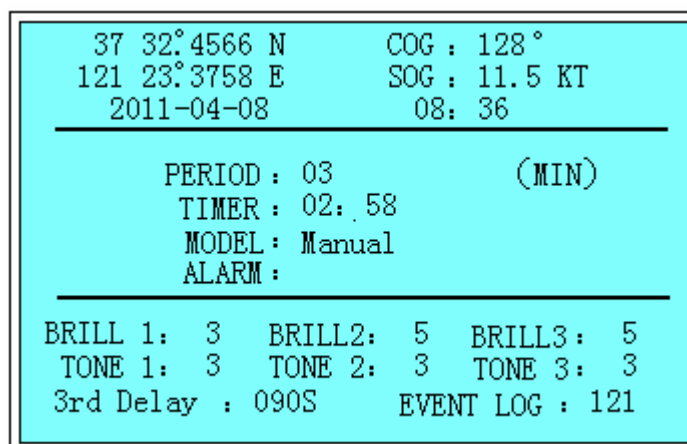


Fig.3 Display of Main Unit



Fig.4 First Reset / Alarm Unit

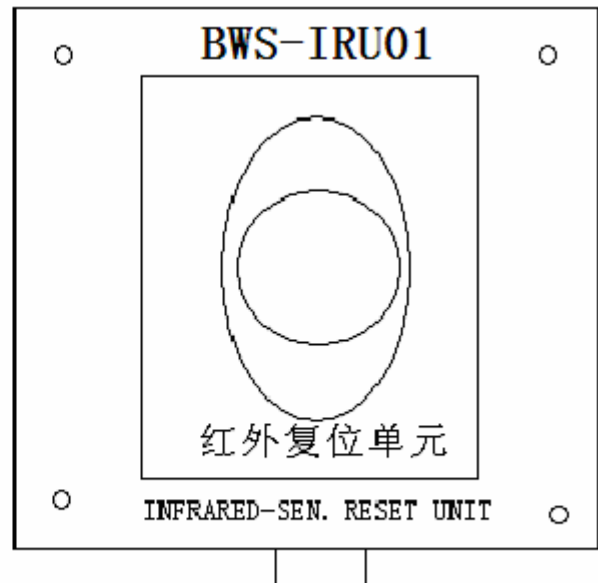


Fig.5 Infrared-sensing Reset Unit

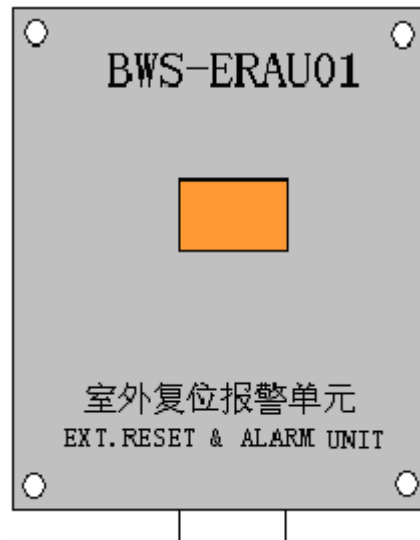


Fig.8 First Reset / Alarm Unit (outdoor)



Fig.6 Second Alarm Unit

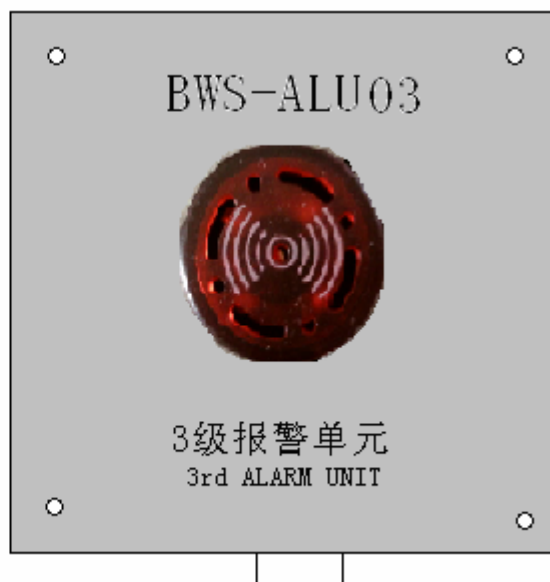


Fig.7 Third Alarm Unit

Security: The following controls should be restricted to the master only, after he open the Main Control Unit using the special key !

4.2 “POWER SUPPLY” setup

Set the AC power selection switch rightly: If ship's main AC power is 110V slide the switch lever to the left side; If ship's main AC power is 220V slide the switch lever to the right side.

Note 1: The default power supply setup is 220V.

4.3 “LANGUAGE” Setup

Set the LANGUGE switch to “ENGLISH”, the system displays in English; set to “中文” (CHINESE) , the system displays in Chinese.

Note 2: “POWER SUPPLY” and “ LANGUAGE” must be set before the system is turned on.

4.4 “START” the system

Press the “POWER” switch to turn on the system, performs self-check:the

buzzer sounds once, all indicators keep lighting for 4s; the buzzer sounds once again, all indicators keep extinguishing for 4s; and then the system begins to work normally.

4.5 “OPERATION MODE” Setup

Set the MODE switch to “MAN. OFF”, the “MAN. OFF” light lights, and the system never activates, the timer stops; Set the MODE switch to “MAN. ON”, the “MAN. ON” light lights, the system always activates, the timer runs; Set the MODE switch to “AUTO”, the “AUTO” light lights: when activating the timer runs, when not activating the timer stops.

Note3: When exchange between “MAN. ON” and “AUTO”, the system will restart automatically.

4.6 “PARAMETERS” Setup

4.6.1 “DORMANT PERIOD” Setup

After started the system, open the Main Control Unit upper cover, press the SET switch inside Main Control Unit, the buzzer sounds once, the value of the dormant period (Td) blinks, press “+” to increase (maximum 12min), and press “-” to decrease (minimum 3min).

4.6.2 “BRILLANCE of MAIN UNIT and FIRST STAGE” Setup

Press “ENT” key, the value of the first stage brilliance blinks, press “+” key to increase (maximum 9), and press “-” key to decrease (minimum 0).

4.6.3 “TONE of FIRST STAGE” Setup

Press “ENT” key, the value of the first stage tone blinks, press “+” key or press “-” key to select it (0~9).

4.6.4 “BRILLANCE of SECOND STAGE” Setup

Press “ENT” key, the value of the second stage brilliance blinks, press “+” key to increase (maximum 9), and press “-” key to decrease (minimum 0).

4.6.5 “TONE of SECOND STAGE” Setup

Press “ENT” key, the value of the second stage tone blinks, press “+” key or press “-” key to select it (0~9).

4.6.6 “BRILLANCE of THIRD STAGE” Setup

Press “ENT” key, the value of the third stage brilliance blinks, press “+” key to increase (maximum 9), and press “-” key to decrease (minimum 0).

4.6.7 “TONE of THIRD STAGE” Setup

Press “ENT” key, the value of the third stage tone blinks, press “+” key or press “-” key to select it (0~9).

4.6.8 “DELAY” between the second and third Setup

Press “ENT” key, the value of delay between the second and third stage alarm blinks, press “+” key to increase (maximum 180s), and press “-” key to decrease (minimum 90s).

4.6.9 “DATE” Setup

Press “ENT” key, the value of Year blinks, press “+” key to increase, and press “-” key to decrease; Press “ENT” key, the value of Month blinks, press “+” key to increase, and press “-” key to decrease; Press “ENT” key, the value of Day blinks, press “+” key to increase, and press “-” key to decrease.

4.6.10 "TIME" setup

Press "ENT" key, the value of Hour blinks, press "+" key to increase, and press "-" key to decrease; Press "ENT" key, the value of Minute blinks, press "+" key to increase, and press "-" key to decrease.

Press "ENT" key, will return to 4.6.1 "DORMANT PERIOD" Setup; Press "ESC" key return to normal work state.

4.6.11 "VOLUME" of each ALARM UNIT

"VOLUME" of each ALARM UNIT can be adjusted by "VOL" potentiometer inside each unit. (First Stage: 75dB ≤ from 1m ≤ 85dB ; Second & Third Stage : 75dB ≤ from 1m ≤ 120dB)

Note 4: During setting parameters, if do not want to adjust the following parameters, press 'ESC' key or wait for 20 minutes, the system will return to normal work state.

Note 5: In normal work state, press "+" key or "-" key can set the brilliance of Main Control Unit and First Reset / Alarm Unit directly.

Note 6: When alarming, brilliance of each stage reaches maximum, until reset it .

4.7 "MUTE"

If a malfunction of, AC power supply failure, or DC power supply failure, or steering engine and GPS data failure, these will be each indicated by Main Control Unit in visual and audible alarm, Press "MUTE" key to silence the audible alarm, but keep visual alarm until removing failure.

4.8 "EMERGENCY CALL"

When no any alarm, open “EMERGENCY CALL” lip cover, and keep pressing “EMERGENCY CALL” key for 3s, the system activate the second, and subsequently third stages visual and audible alarm; Press “MUTE” to cancel it.

4.9“SELF-TEST”

When no any alarm, keep pressing “RST” key and “MUTE” simultaneously , the system activate “SELF-TEST”, Release these two keys, return to normal work state.

5、 OUTPUT DATA PROTOCOL

5. 1 FORMAT (Baud Rate 38400bps):

\$BNALR, hhmmss,xxx,A,V,C1=AUT;C2=03;C3=1*hh<CR><LF>

5. 2 MESSAGE CONTENTS

- hhmmss: UTC time
- xxx: source of alarm and reset command, “000 “= automatic mode
- A: A=Dormant period exceeded
V= Dormant period not exceeded
- A: A=Alarm acknowledged
V= Alarm unknowledged
- C1--C3: BNWAS mode
C1=AUT or MAN or OFF
C2=Dormant period in min, (03-12)
C3=Alarm stage: 1, 2 or 3.

6、 INSTALLATION

6.1 Considerations and Outline Dimension

6.1.1 Installation Consideration

- 1.In accordance with Guidelines for BNWAS Installation of each CLASS.
- 2.Main Control Unit shall be located in a position on the bridge where it is ventilated and easily accessible .
- 3.First stage Reset / Alarm Unit shall be located in position on the bridge giving proper look out, and reset function shall be easily accessible from the conning position, the workstation for navigating and manoeuvring, the workstation for the monitoring and the bridge wings.
- 4.Second and third stage Alarm Unit shall be located in position In Captain's bedroom ,Deck officer's cabins and public places (such as Mess room, Saloon, Recreation room and ship's office) , where it is able to wake up the people.
- 5.To connect all units and input / output equipments correctly according to Connection Schematic Drawing.
- 6.To keep good Ground(GND) connection for the system.

6. 1.2 Outline Dimension Drawings (unit : mm)

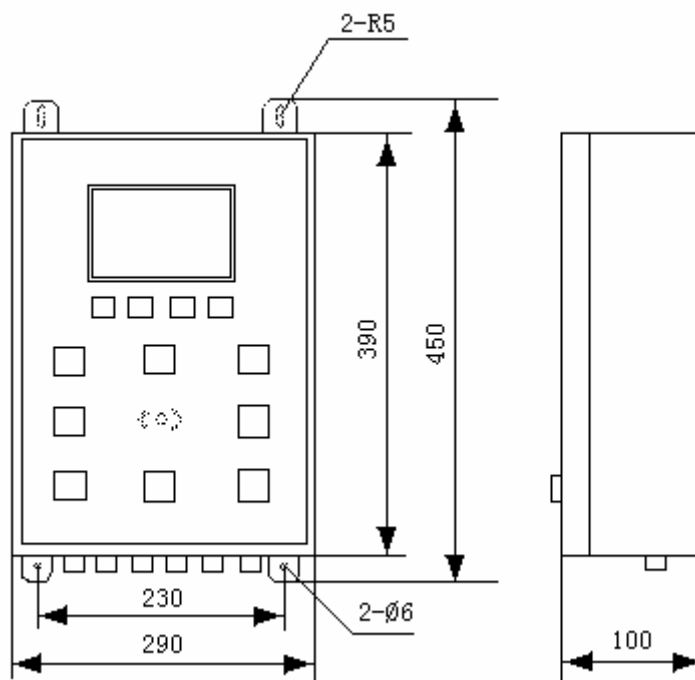


FIG.8 Main Control Unit

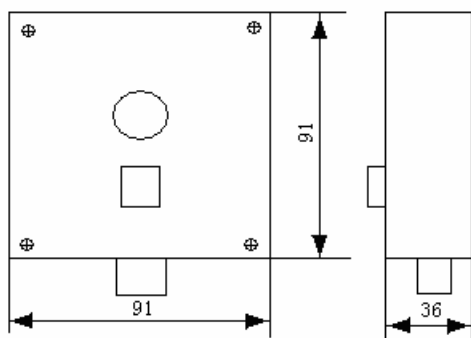


FIG.9 Reset/Alarm Unit

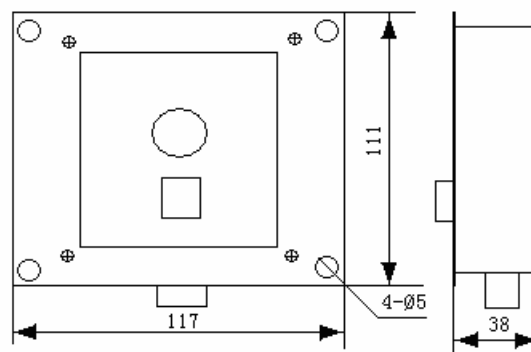


FIG.10 Reset/Alarm Unit (imbedding)

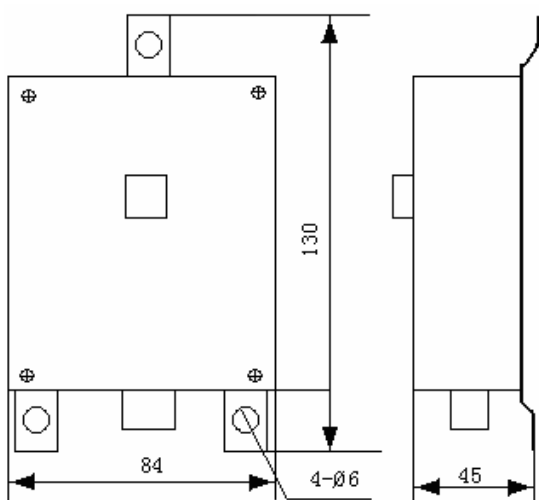


FIG.11 Reset/Alarm Unit (outdoor)

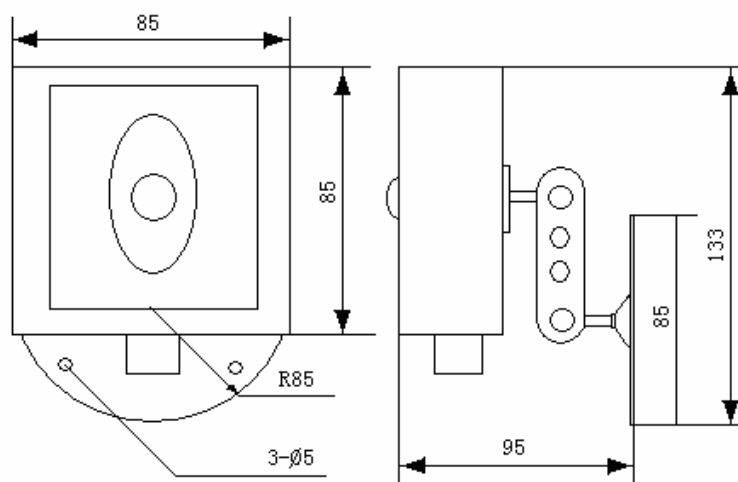


FIG.12 Infrared-sensing Reset Unit (with holder)

6. 2 COMPASS SAFE DISTANCE

MAME OF UNITS	DISTANCE
Main Control Unit / BR-180	Standard: 0.42m、Steer: 0.32m
First Stage Reset &Alarm Unit / BWS-RAU01	/
First Stage Reset &Alarm Unit / BWS-ERAU01	/
Infrared-sensing Reset Unit / BWS-ISU01	/
Second, Third Alarm Unit / BWS-RAU02/03	/

6. 3 Block Diagram of Installation

(See DRAWINGS 1)

6. 4 Connection Diagram of Installation

(See DRAWINGS 2)

APPENDIX1: PACKAGE LIST

NO.	NAME	COUNT	REMARKS
1	Main Control Unit / BR-180	1	
2	First Stage Reset & Alarm Unit / BWS-RAU01	2	
3	First Stage Reset & Alarm Unit / BWS-ERAU01	2	
4	Infrared-sensing Reset Unit / BWS-ISU01	1	
5	Second Alarm Unit/ BWS-RAU02	1	
6	Third Alarm Unit / BWS-RAU03	3	
7	Fuse (1A)	1	For F4
8	Fuse (3A)	3	For F1 –F3
9	Screw (4 X 25)	4	For Main Uint
10	Screw (3 X 20)	40	For Alarm Uint
11	Screw、Nut (8 X 40)	6	For Reset/Alarm Units (outdoor)
12	Amphenol Connector ϕ 3	40	For Connection
13	Operator's Manual	1	Chinese/English
14	Manufacturer Certificate	1	
15	CCS Certificate of Type Approval (Copy)	1	
16	CCS Certificate of Product	1	

(Thanks for your selection of our products, if you have any problem connect with your seller please.)