Bridge Navigational Watch Alarm System

BW508

Operation & Installation Manual


NINGLU

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Contents

Foreword

Bridge Navigational Watch Alarm System is to monitor 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 and, if he is not responding, then to alert the Master or another qualified OOW. Additionally, BW508 also provide the OOW or other equipment with a means of emergency calling for immediate assistance.
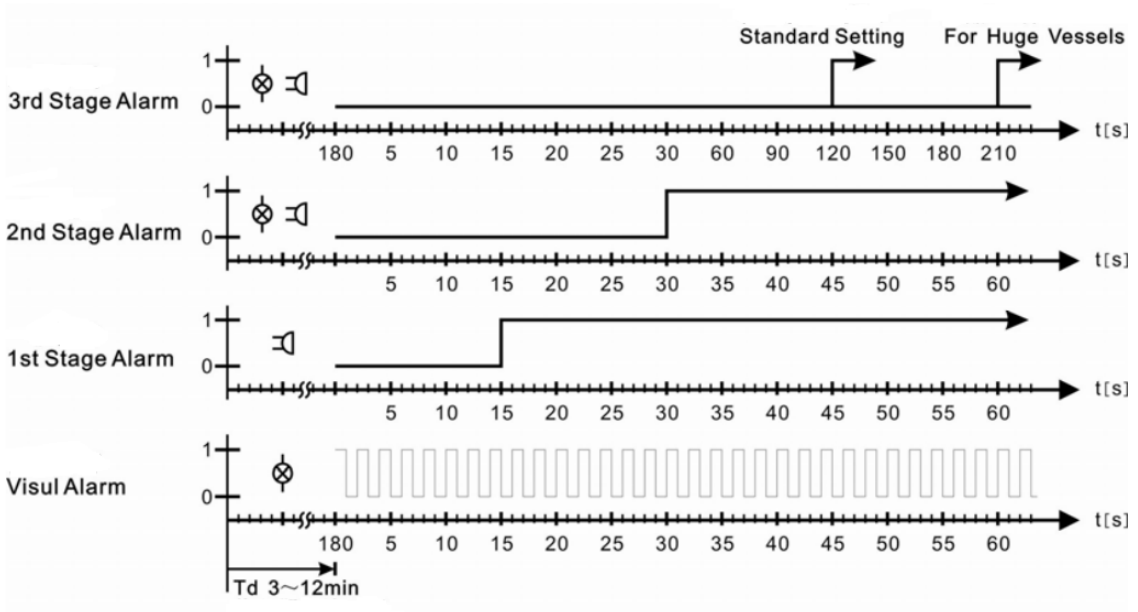
Time table

System description

The whole Bridge Navigational Watch Alarm System consists of operating device, connecting module, reset button, 1st Stage Alarm, 2nd Stage Alarm, 3rd Stage Alarm and AC adapter.

Operating device   BW508MAIN

Display screen: 2*16 LCD

Internal buzzer: use for 1st Stage Alarm

Key switch S1: choose operational modes and setting

Rotary encoder S2: use for system's setting and adjustment

Emergency call S3: use for emergency call's trigger and reset

Power failure indicator L1: indicate main power supply failure

Run normally indicator L2: indicate system run normally

Auto indicator: indicate system in auto mode

ON indicator: indicate system in manual on mode

OFF indicator: indicate system in manual off mode

Installation Location: bridge area

Installation mode: flush or vertical mounting

Connecting module   BW508CONN

Installation Location: bridge area

Installation mode: TS35 rail mounting

Reset button   BW508R

Installation Location: bridge area

Installation mode: type A : flush mounting , type B : wall mounting

Number of installations: max.6

1st Stage Alarm   BW508RA1

Installation Location: bridge wings

Installation mode: wall mounting

Number of installations: max.3

2nd Stage Alarm   BW508A2

Installation Location: officer's cabin area

Installation mode: type A : wall mounting , type B : flush mounting

Number of installations: max.4

3rd Stage Alarm   BW508A3

Installation Location: officer's corridor area

Installation mode: wall mounting

Number of installations: max.2

AC Adapter   BW508ADPT

Installation Location: bridge area

Installation mode: wall mounting

Specification

Operating temperature: - 5 ℃ ~ +55 ℃

Relative humidity :   93% + 2% (at 40±3℃)

Power supply: 24VDC (nominal)

Power consumption: less than 75W

Timings accuracy: less than 5 % or 5s

1st Stage Alarm tone: 8 kinds

1st Stage Alarm volume level: 75~85db/1m

2nd Stage Alarm volume level: 75~120db/1m

Degree of enclosure& safety distances to magnetic compass

Model type	degree of enclosure	Safety distances to magnetic compass
BW508MAIN	IP20	Standard 0.49m Steering 0.35m
BW508CONN	IP00	Standard 0.42m Steering 0.37m
BW508RA1	IP65	/
BW508R,A2,A3	IP20	/

Interfacing

Interfacing Name	I/O	Form
heading or track control system	Input	switching value
emergency call	Input	switching value
external reset devices	Input	switching value
status output	Output	ALR/ switching value
malfunction output	Output	switching value

Setting

Select dormant period (Td)

In case that authorized person (Master) demands to select other dormant period, person has to turn key switch S1 on BW508MAIN to position "SET". In this position only dormant period can be chosen by using rotary encoder S2. Display is showing as follow

```
SET MAIN PERIOD
3...12 MIN   **3**
```

By turning rotary encoder S2 in clock wise direction, value is increasing. By tuning rotary encoder S2 in counter clock wise direction, value is decreasing. Possible main period value is limited between 3 and 12 min. Step width is 1 min. By turning key switch S1 into centre position, system accepts new value.

Adjust buzzer characteristics of 1st Stage Alarm

1st Stage Alarm internal buzzer's sound characteristics can be adjusted.

By turning key switch S1 on BW508MAIN to position "SET". Display is showing as follow

```
SET MAIN PERIOD
3...12 MIN   **3**
```

Now push rotary encoder S2 on operating device BW508MAIN repeatedly till the display is showing as follow

```
____BUZZERS____
_PROPERTIES 1_
```
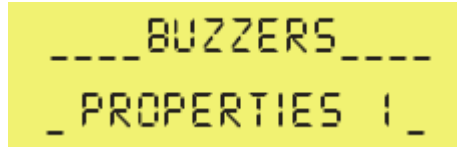
Now turn rotary encoder S2 to choose an adequate buzzer characteristic. By pushing rotary encoder S2 display is changing and system accepts adjusted value.

Adjust buzzer's volume of 1st Stage Alarm

1st Stage Alarm internal buzzer's sound volume (1~15) can be adjusted.

To adjust internal buzzer's volume turn key switch S1 on BW508MAIN to position "SET". Display is showing as follow

```
SET MAIN PERIOD
3...12 MIN   **3**
```

Now push rotary encoder S2 on BW508MAIN repeatedly till the display is showing as follow

```
____BUZZERS____
SOUND VOLUME 15
```
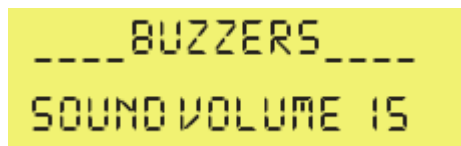
Now turn rotary encoder S2 in counter clock wise direction to decrease buzzer's sound volume or in clock wise direction to increase sound volume. By pushing rotary encoder S2 display is changing and system accepts adjusted value.

Adjust time period of 2nd Stage Alarm

Adjustment could be necessary due to large vessel. Period can be adjusted to max. 180sec (default value is 90sec), to allow sufficient time

for back-up officer and/or Master to reach bridge area before watch alarm system is triggering 3rd Stage Alarm .

To adjust a.m. time period turn key switch S1 on BW508MAIN to position "SET". Display is showing as follow

```
SET MAIN PERIOD
3...12 MIN  **3**
```

Now push rotary encoder S2 on BW508MAIN repeatedly till the display is showing as follow

```
_PERIOD ADJUST
_AL.STAGE2 90S
```

Now turn rotary encoder in clockwise direction to increase time period value or in counter- clock wise direction to decrease time period value. System allows only value between 90 and 180sec. By pushing rotary encoder S2 display is changing and system accepts adjusted value.

Adjust backlight of LCD and BW508R
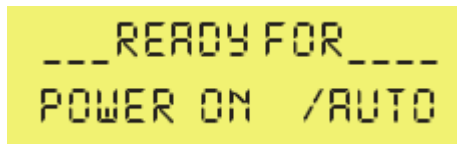
If you want to adjust backlight of LCD and BW508R .Please turn rotary encoder in clockwise direction to brighten, in counter- clock wise direction to dim.

Operational mode

Automatic
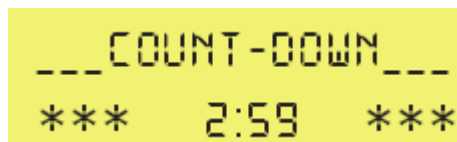
System can be switched on by external systems (ship's heading or track control system)

By turning key switch S1 left once. System is in AUTO mode. Auto indicator is on. Display is showing as follow.

```
___READY FOR____
POWER ON  /AUTO
```
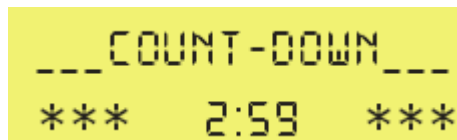
When ship's heading or track control system is activated, system's running is triggered. Count-down is active as shown on display as follow.

```
___COUNT-DOWN___
***   2:59   ***
```

Manual ON

Authorized person (Master) switches on system by turning key switch S1 left twice. Count-down is active as shown on display as follow.

```
___COUNT-DOWN___
***   2:59   ***
```

Manual OFF

Master is able to shut down system by turning key switch S2 left for longer than 2 sec .

Operation

Dormant

Turn the key to choose the operational mode. After system running is trigged. Dormant (main) period count-down is active as shown on display as follow.

```
___COUNT-DOWN___
***   2:59   ***
```
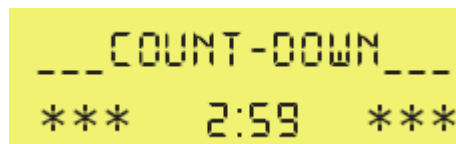
Visual indications

If dormant period (Td) is over without OOW's reset, system activates all illuminated reset units by 1Hz flash light. Display is showing in 1Hz toggle mode display

```
RESET EXPECTED
___ 0:14 ___
```

```
RESET EXPECTED
___ 0:13 ___
```
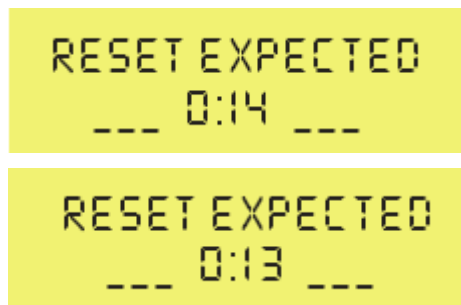
1st Stage Alarm

If dormant (main) period, visual indications (15 sec) are over without OOW's reset, system additionally activates 1st Stage Alarm located on bridge wing area. Display is showing in 1 Hz toggle mode display as follow.

9

```
RESET EXPECTED
    0:14
___      ___
```

```
ALARM    STAGE1
    0:13
___      ___
```

2nd Stage Alarm

If dormant (main) period, visual indications (15 sec) and 1st Stage Alarm (15 sec) are over without OOW's reset, system additionally activates 2nd Stage Alarm. Display is showing in 1 Hz toggle mode display as follow

```
_ALARM STAGE 2__
_____0:89_____
```

```
_ALARM STAGE 2__
_____0:88_____
```

3rd Stage Alarm

If dormant (main) period, visual indications (15 sec), 1st stage Alarm (15 sec) and 2nd stage Alarm (90 sec) are over without OOW's reset, system additionally activates 3rd Stage Alarm. Display is showing as follow

```
RESET EXPECTED
ALARM    STAGE3
```

```
GENERAL ALARM
   RELERSED
```

Reset

OOW resets system by pushing reset button of BW508R or BW508RA1, and also can push rotary encoder on BW508MAIN.

Every reset is re-starting complete count-down.
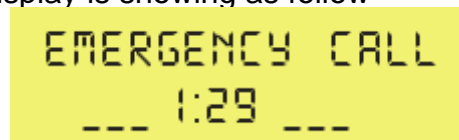
External reset devices input switching value input to reset alarm.

We offer motion detectors BW508PIR.It's operating instruction refers to the interleaf.
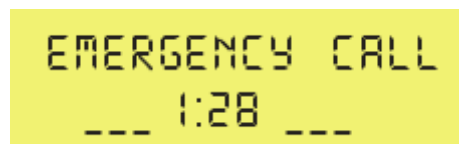
Emergency call

OOW is able to generate an emergency call by pushing Emergency call button on BW508MAIN

This activates without delay 2nd Stage alarm and subsequently 3rd Stage alarm later on. Display is showing as follow

```
EMERGENCY CALL
___ 1:29 ___
```

```
EMERGENCY CALL
___ 1:28 ___
```

Emergency Call feature is also activated when system is shut-down!

Emergency Call reset is possible by pushing Emergency call button again.

Transfer of alarms

Other equipment can transfer an alarm to system by switching value

immediately actuate the "Emergency Call" system. Display is showing as follow

```
TRANSFER ALARM
___ 1:29 ___
```

```
TRANSFER ALARM
___ 1:28 ___
```

System output

Status output （bit rate 4800bps）

Any change of system settings for mode or changing dormant period, and with any activated and reset alarm can be sent to (VDR) by using the switching value or ALR sentence.

For example:

$BNALR,,000,A,V,C1=AUT;C2=03;C3=1*hh<CR><LF>

Explanation:

C1: System is in auto mode.

C2: Td is 3min.

C3: 1st Stage Alarm is activated.

Security

The means of selecting the Operational Mode and the duration of the Dormant Period (Td) shall be security protected so that access to these controls should be restricted to the Master or someone with the key.

Test

BW508 owns a test mode procedure to check all output relevant devices (alarm panels, external buzzers, links to alarm devices, and system failure contact) in a very comfortable manner.

To reach this "test mode" an authorized person has to "switch off" system. After that authorized person keep pushing rotary encoder S2 and switch on system at the same time. System starts in "test mode 1" and display is showing as follow

```
TEST MODE1 OFF
ALARM ON BRIDGE
```

1st Stage Alarm is activated as long as S2 is pushed again. The 1st Stage Alarm indication on BW508CONN is on. Display is showing as follow

```
TEST MODE1 ON
ALARM ON BRIDGE
```

After a.m. test in "test mode 1" is done, user has to turn S2 clockwise to reach "test mode 2". Display is showing as follow

```
TEST MODE2 OFF
OFFICERS ALARM
```

2nd Stage Alarm is activated as long as S2 is pushed again. The 2nd Stage Alarm indication on BW508CONN is on. Display is showing as follow

```
TEST MODE2 ON
OFFICERS ALARM
```

After a.m. test in "test mode 2" is done, user has to turn S2 clockwise to reach "test mode 3". Display is showing as follow

```
TEST MODE3 OFF
ALARM STAGE 3
```

3rd Stage Alarm is activated as long as S2 is pushed again. The 3rd Stage Alarm indication on BW508CONN is on. Display is showing as follow

```
TEST MODE3 ON
ALARM STAGE 3
```

After a.m. test in "test mode 3" is done, user has to turn S2 clockwise to reach "test mode 4". Display is showing as follow

```
TEST MODE4 OFF
DEVICE FAILURE
```

Device's failure contact opens as long as push button S2 is pushed again. The devices failure indication on BW508CONN is off. Display is showing as follow

```
TEST MODE4 ON
DEVICE FAILURE
```

For finishing "test mode" procedure "switch off" system by turning key switch S1 on BW508MAIN left again for longer 2 sec.

Malfunctions

Main power failure

Power failure indicator L1 and buzzer alarm of BW508MAIN auto turns on, then the power will be supplied by storage battery.

Meanwhile, the POWER light of BW508MAIN goes off and BW508MAIN outputs power failure relays to external equipments.

Press rotary encoder S2 to mute the buzzer but the power failure indicator L1 is still on until failure solved.

Battery supply

When the supply of Main power is off, the power failure indicator and Emergency Call facility can be operated with battery supply for a period of 6h.

Malfunctions indication

Run normally indicator L2 on BW508MAIN is off.

Run normally indicator on BW508CONN is off.

Malfunctions output

System can output switching value for connection to central alarm panels to repeat the malfunction indication.

System Installation

Installation dimension

BW508MAIN   unit : mm
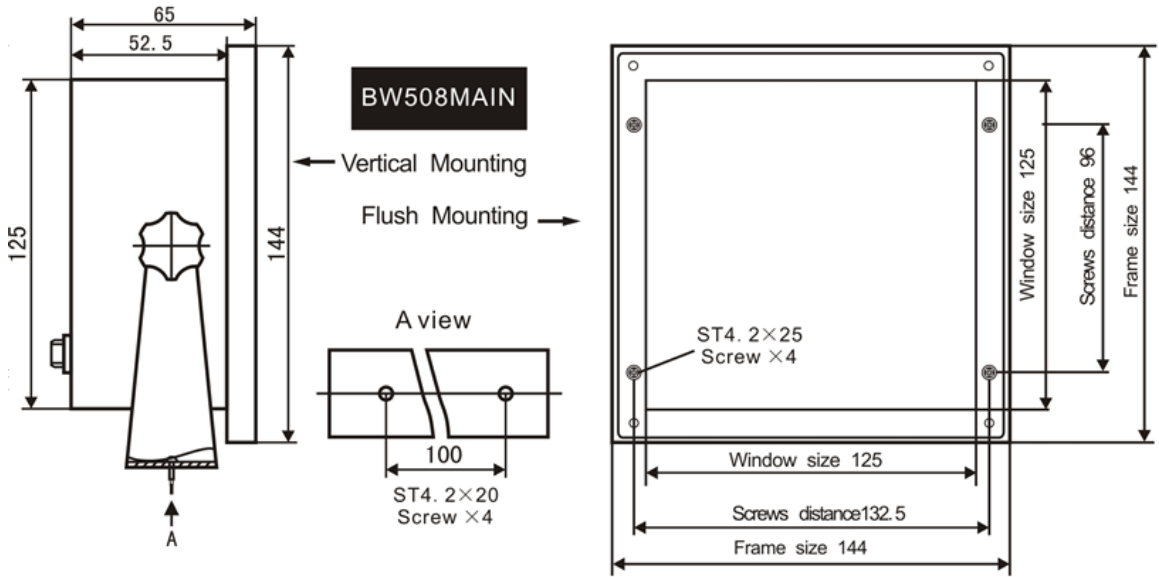
BW508CONN

BW508R-A

Flush Mounting

Outline Dimension Φ40

Hole Size Φ22.5
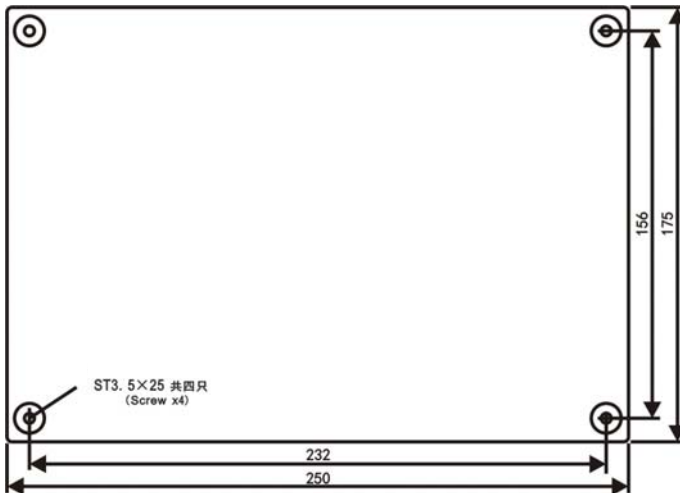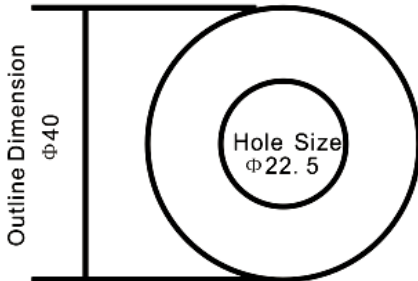
BW508R-B/RA1/A2-A

Wall Mounting

105
180

ST4.2X25
Screw x4

105
125
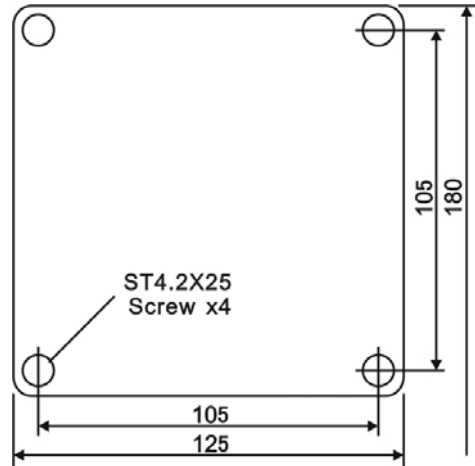
BW508A2-B

Flush Mounting

132
144

ST4.2×25
(Screw x4)

60
72
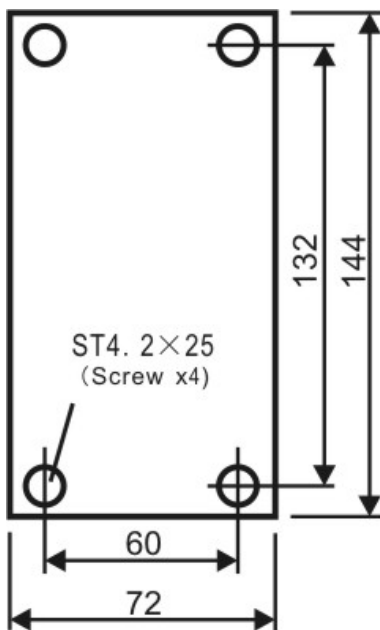
BW508A3-A

Wall Mounting

Wall Mounting

BW508 A3

ST4. 2×25
Screw ×4

105
250
105
125

BW508A3-B

Wall Mounting

Φ111

ST4.2X25
Screwx2

55~80
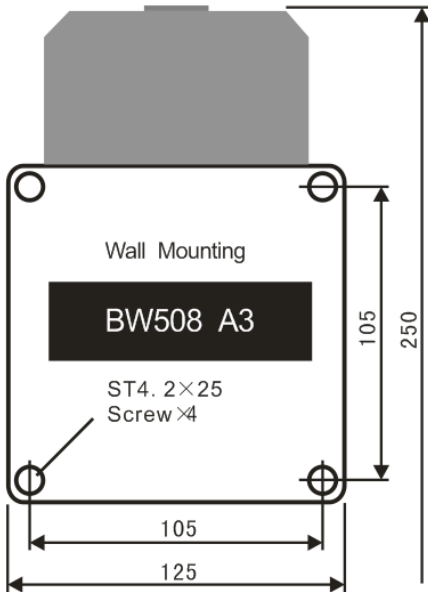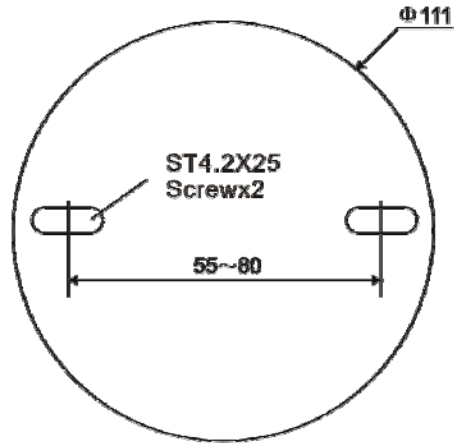
BW508ADPT

Wall Mounting

ST4. 2×25
(Screw ×2)

141

60
80
90

System Diagrams

INPUT

BW508RA1
1st Stage Alarm

Heading or Track
Control System

Switching Value
Input

Bridge Wings

Bridge Area

BW508R-A
Reset Button（Type A）

BW508MAIN
Control Unit

BW508R-B
Reset Button（Type B）

BRIDGE WATCH ALARM

Count-down
2 59

POWER RUN

Emergency Transfer

Switching Value
Input

External Device Reset

Switching Value
Input

BW508CONN
Connect Module

AC110/220V   BW508ADPT   DC24V

OUTPUT

Battery Power DC24V

Status Output

NMEA0183（ALR）

BW508A2-A
2nd Stage Alarm (Type A)

BW508A2-B
2nd Stage Alarm (Type B)

Officer's Cabin Area

Officer's Corridor Area

Malfunction Output

Switching Value
Output

BW508A3-A
3rd Stage Alarm (Type A)

BW508A3-B
3rd Stage Alarm (Type B)

19

BW508 Internal Wiring Diagram

CONN				RVVB(Innerdiameter)			
CONN	1	Main power +		1~2.5mm²	+ / −	AC adapter BW508ADPT	DC24←—AC220/110V
	2	Main power -					

CONN	3	Emergency power+		1~2.5mm²	+ / −	DC24V
	4	Emergency power -				

CONN	25	GND		0.2~2.5mm²	X1&3	Reset button BW508R-B	Black	Reset button BW508R-A
	26	Watch rest (ok)			4		Red	
	27	light			X2		Blue	

CONN	28	GND		0.2~2.5mm²	X1&3	Reset button BW508R-B	Black	Reset button BW508R-A
	29	Watch rest (ok)			4		Red	
	30	light			X2		Blue	

CONN	31	GND		0.2~2.5mm²	X1&3	Reset button BW508R-B	Black	Reset button BW508R-A
	32	Watch rest (ok)			4		Red	
	33	light			X2		Blue	

CONN	64	GND		0.2~2.5mm²	X1&3	Reset button BW508R-B	Black	Reset button BW508R-A
	65	Watch rest (ok)			4		Red	
	66	light			X2		Blue	

CONN	67	GND		0.2~2.5mm²	X1&3	Reset button BW508R-B	黑	Reset button BW508R-A
	68	Watch rest (ok)			4		红	
	69	light			X2		蓝	

CONN	70	GND		0.2~2.5mm²	X1&3	Reset button BW508R-B	黑	Reset button BW508R-A
	71	Watch rest (ok)			4		红	
	72	light			X2		蓝	

CONN	17	GND		0.2~2.5mm² outerdiameter: 9~15mm	2/4/6	1st stage alarm BW-508RA1
	20	light			1	
	18	Watch rest (ok)			3	
	19	buzzer			5	

CONN	34	GND		0.2~2.5mm² outerdiameter: 9~15mm	2/4/6	1st stage alarm BW-508RA1
	35	light			1	
	36	Watch rest (ok)			3	
	37	buzzer			5	

CONN	73	GND		0.2~2.5mm² outerdiameter: 9~15mm	2/4/6	1st stage alarm BW-508RA1
	74	light			1	
	75	Watch rest (ok)			3	
	76	buzzer			5	

CONN	21	BW508A2 +		0.2~2.5mm²	3 / 1	2nd stage alarm BW-508A2	4 / 2	3 / 1	2nd stage alarm BW-508A2	4 / 2
	22	BW508A2 -								

CONN	38	BW508A2 +		0.2~2.5mm²	3 / 1	2nd stage alarm BW-508A2	4 / 2	3 / 1	2nd stage alarm BW-508A2	4 / 2
	39	BW508A2 -								

CONN	23	BW508A3 +		0.5~2.5mm² outerdiameter: 9~15mm	1 / 4	3rd stage alarm BW-508A3	2 / 5	1 / 4	3rd stage alarm BW-508A3	2 / 5
	24	BW508A3 -								

BW508 External Wiring Diagram

RVVB(Innerdiameter)

| CONN | 12 | AUTO ON switching value input | 0.2~2.5mm² | heading or track control system input (valid input: locked closure) |
| | 13 | AUTO ON switching value input | | |

| CONN | 9 | external reset switching value input | 0.2~2.5mm² | motion detector input (valid input: moment closure) |
| | 10 | external reset switching value input | | |

| CONN | 14 | external reset switching value input | 0.2~2.5mm² | motion detector input (valid input: moment closure) |
| | 16 | external reset switching value input | | |

| CONN | 53 | external reset switching value input | 0.2~2.5mm² | motion detector input (valid input: moment closure) |
| | 55 | external reset switching value input | | |

| CONN | 5 | alarml transfer switching value input | 0.2~2.5mm² | alarm transfer input (valid input: moment closure) |
| | 6 | alarml transfer switching value input | | |

| CONN | 44 | alarml transfer switching value input | 0.2~2.5mm² | alarm transfer input (valid input: moment closure) |
| | 45 | alarml transfer switching value input | | |

| CONN | 46 | alarml transfer switching value input | 0.2~2.5mm² | alarm transfer input (valid input: moment closure) |
| | 47 | alarml transfer switching value input | | |

| CONN | 48 | alarml transfer switching value input | 0.2~2.5mm² | alarm transfer input (valid input: moment closure) |
| | 49 | alarml transfer switching value input | | |

| CONN | 51 | alarml transfer switching value input | 0.2~2.5mm² | alarm transfer input (valid input: moment closure) |
| | 52 | alarml transfer switching value input | | |

| CONN | 56 | diagnosis switching value output | 1~2.5mm² | malfunctions diagnosis output (malfunction:open value output) |
| | 57 | diagnosis switching value output | | |

| CONN | 58 | alarml status switching value output | 1~2.5mm² | 1st stage alarm status output (alarm:closure value output) |
| | 59 | alarml status switching value output | | |

| CONN | 60 | alarml status switching value output | 1~2.5mm² | 2nd stage alarm status output (alarm:closure value output) |
| | 61 | alarml status switching value output | | |

| CONN | 62 | alarml status switching value output | 1~2.5mm² | 3rd stage alarm status output (alarm:closure value output) |
| | 63 | alarml status switching value output | | |

| CONN | 77 | NMEA0183 output A | 0.2~2.5mm² | system status output NMEA0183(ALR) |
| | 78 | NMEA0183 output B | | |

| CONN | 80 | NMEA0183 output A | 0.2~2.5mm² | |
| | 81 | NMEA0183 output B | | |