

# *Guard Level®*

## *WATER INGRESS ALARM SYSTEM*

*With WIAS-1A Sensor*



- Simple installation
- Suitable for all bulk cargoes
- Testing (in-situ), installation and maintenance of sensor can be done from deck level at any time, with empty or full cargo hold. **NO CLIMBING INTO CARGO HOLD.**
- One intrinsically safe sensor assembly per hold (swaged on cable) provides both the pre and the main-alarm functions. Sensor requires no calibration.
- Rugged, intrinsically safe SS deck junction box with built-in convenient cleaning port and test port.
- Simple sounding pipe (ND50, 2") provides mechanical protection of the sensor and sensor cable (DE 46 Section 2.3.5) without troublesome filters and other physical protection. Pipe is easily blown clean (if necessary) from deck level.
- Optional: Guard Level® Water Ingress Alarm with Gauging
- High quality and competitive price
- Class approved

# THE SYSTEM & SOLUTION

When the Bergan Company set out to design a system that fully met all regulatory requirements we knew we had to provide a system that was simple and reliable. Our system is simple to install in new buildings and is easily retrofitted into existing bulk carriers in the shortest possible time. We also designed it to comply with the water ingress alarm requirement proposed for general cargo ships.

Our experience is built upon a solid track record (since 1975) of providing liquid overfill protection for all types of tanker vessels. There are more than 18,000 tanks being protected and never has a spill occurred with the Bergan Guard Level® 07324 level alarm system aboard. This track record is unrivaled in the industry. Our knowledge and dedication has been combined to engineer a water ingress alarm system worthy of the Guard Level® name.

After exhaustive testing, our WIAS-1A submersible “drop-in” sensor was found to yield excellent results.

- There are no moving parts so there is no sticking of the sensor due to cargo residue contamination.
- There are no false alarms due to sensor movement caused by heavy seas.
- There are no short circuits from high humidity conditions.
- There is no magnetic interference from iron ore cargos.
- The technology is fully mature and based on our previous installation experience.
- The sensor can be tested in-situ from deck level with empty or full cargo hold, giving the crew 100% confidence that the system is working.
- The system allows the shipyard a simpler installation with fewer cable conductors and simple alarm point placement.
- The WIAS-1A sensor can be used on any vessel in the fleet making spare parts logistics simple.
- The Guard Level Water Ingress Alarm system requires a minimum of service, which is done from the deck level. A convenient cleaning port blows out any product that might have entered into the protective tube. Our unique end-stop (patent pending) recesses the WIAS-1A sensor in the tube protecting the sensor from cargo contamination.

Our state-of-the-art water ingress alarm system provides the crew with meaningful and reliable alarms giving ample warning so that countermeasures can be initiated. It is an all-inclusive system designed for the realities of the marine industry. It is simple to install, simple to operate and simple to maintain and is backed by a company you can trust.

When you select a Bergan system for your retrofit or new building you may be confident that you have chosen the best available Water Ingress Alarm that exist today. Our quality is assured through quality control according to ISO 9001/2000. We are committed to after sales service through our worldwide agents (see back cover).

# SYSTEM CONFIGURATIONS & OPTIONS

The Guard Level® Water Ingress Alarm system is an all-inclusive system, designed to meet or exceed the requirements of the regulations for all bulk carriers. Our experience tells us that owners/operators at times wish for optional features. That is why the system is fully modular and very flexible.

We offer the following options:

- 1) Secondary AMU (Alarm Monitoring Display) for B.C.R and or E.C.R.  
From an installation perspective it may make more sense to mount the small enclosure near deck level (possibly the B.C.R.) and then purchase a secondary AMU for the bridge console. This would reduce the number of cables that need to be run to the bridge level.
- 2) Interfacing to VDR (Voyage Data Recorders)
  - a. Digital output (max 32 alarm points per AMU)
  - b. Serial (RS422/485)
- 3) Level Gauging Option. If the owner wishes to have level gauging the Guard Level® WIAS can accommodate this. Instead of the WIAS-1A sensor an HPT-3 sensor is used along with an LCD display. The optional LCD displays critical information about the rate of ingress as opposed to only an alarm light on the AMU as mandated by the regulation. This is possible because the AMU actually calculates the level as well as performing the requisite alarm functions and indications. Depending upon the sensor location this option can also give level indication before the mandated 0.5m pre-alarm. The alerted crew could possibly prevent cargo contamination. Using this feature we would recommend sensor installation in the port and starboard sumps. The Level Gauging LCD Display can be either monochrome or color.
- 4) Spare WIAS-1A sensor. With one (1) spare WIAS-1A sensor you will be able to service any cargo hold. The same sensor can be used on any vessel in the fleet making spare parts logistics simple.

## THE REGULATION

Solas Chapter XII/12 Resolution MSC. 134(76), IACS URS24 and IMO Resolution MSC. 145(77) performance standards mandate that ALL bulk carriers (old and new) have to have a permanently installed water ingress alarm system capable of detecting a pre-alarm and main alarm for each cargo hold and certain void spaces. Complete regulations (PDF format) can be downloaded from our website, [www.icbergan.com](http://www.icbergan.com).

Specifically IMO has mandated that the compliance date for bulk carriers constructed (i.e. keel laid) before 1 July 2004 is:

- 1) No later than the date of the annual, intermediate or renewal survey, whichever comes first, to be carried out after 1 July 2004, for water ingress detection and alarm systems required by XII/12 and.
- 2) Not later than the date of the intermediate or renewal survey, whichever comes first, to be carried out after 1 July 2004, but in no case later than 1 July 2007, for the pumping system requirements of XII/13

Please note that IACS Unified requirements for detection of water ingress into cargo hold of bulk carriers (UR S24 rev. 1a, May 2002) has been withdrawn in light of the adoption of the Solas XII/12 & 13.

Bulk carriers as defined in SOLAS IX/1.6, means a ship which is constructed generally with single deck, top-side tanks and hopper side tanks in cargo spaces, and is intended primarily to carry cargo in bulk and includes such types as ore carriers and combination carriers (as defined in SOLAS II-2/3.27).



# The Guard Level® Water Ingress Alarm System

- Intrinsically safe
- Air blowout cleaning connector with cap
- Self-test port
- No cargo hold entry for test or maintenance
- One per cargo hold



**Deck-Level Junction Box**

- Intrinsically safe
- Polyethylene sensor body
- Stainless steel 316L sensor element
- Output signal: 4-20mA, 2 wire standard
- Bonded on polyethylene cable, 25M standard/ any length to order
- One per cargo hold



**WIAS-1A Sensor**



**Control Panel**

- Visual and audible alarms, pre-alarm and main alarm
- Status indicators/ alarm blocking
- Safety barriers
- Power fail alarm
- Backup power
- Power supply: 110-240VAC
- Dimensions: 380mm/380mm/210mm
- Operator manual
- Available redundant AMU Display for B.C.R. and E.C.R.

**Bridge**

**B.C.R.**

**E.C.R.**



**Optional: 6" LCD Touchscreen for Level Gauging or Ballast Display**

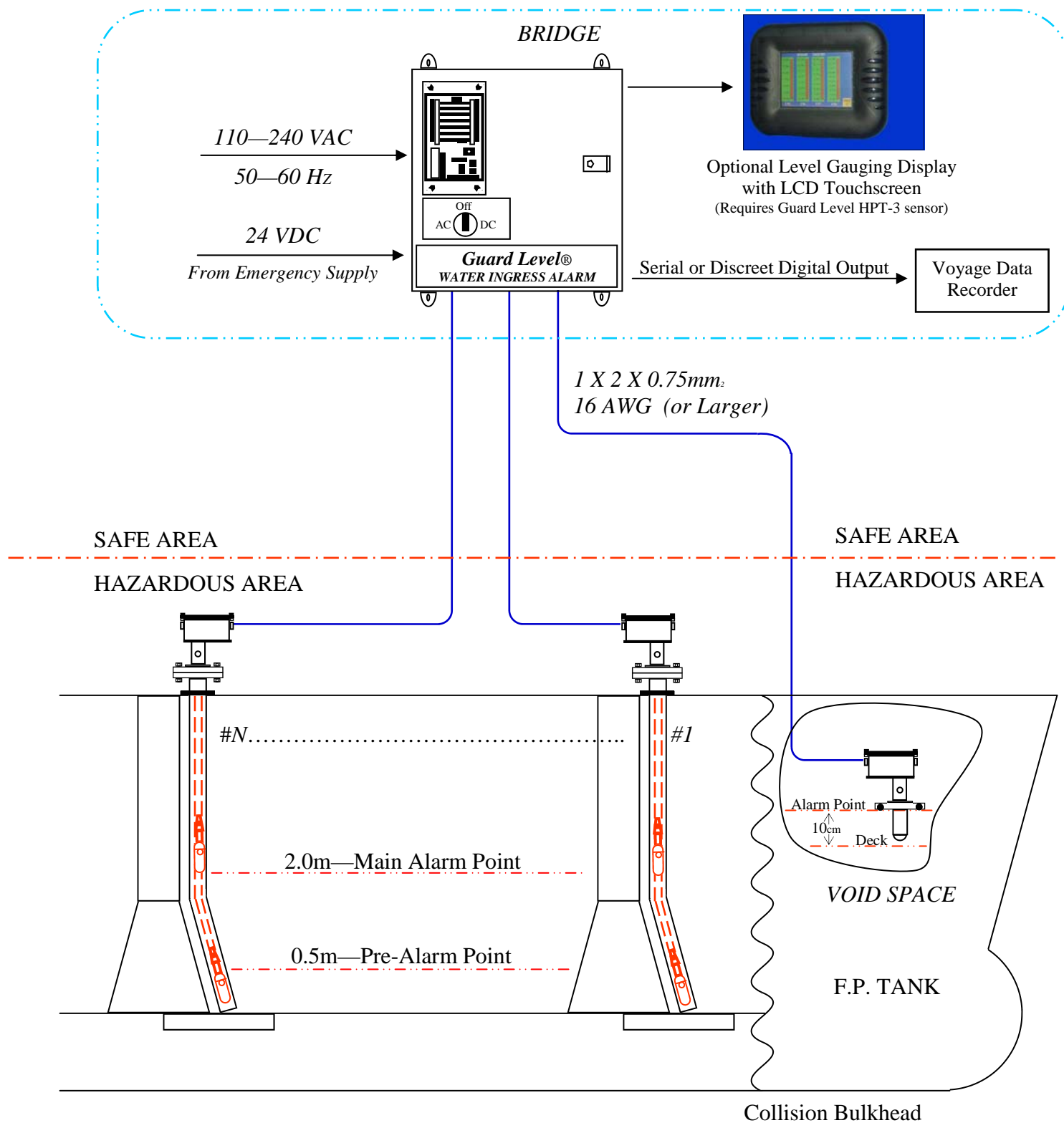
- Custom screens available for level and ballast gauging display
- Connects to Main Control Panel AMU
- Two communication ports - Computer (RS-232C) and PLC (RS-232C, RS-422A or RS-485A)
- Password protection

**Existing Cable Conduit**

**Sounding Pipe**

- Provides protection for sensor and cable
- (NDS0, 2"), supplied by yard

# TYPICAL GENERAL ARRANGEMENT





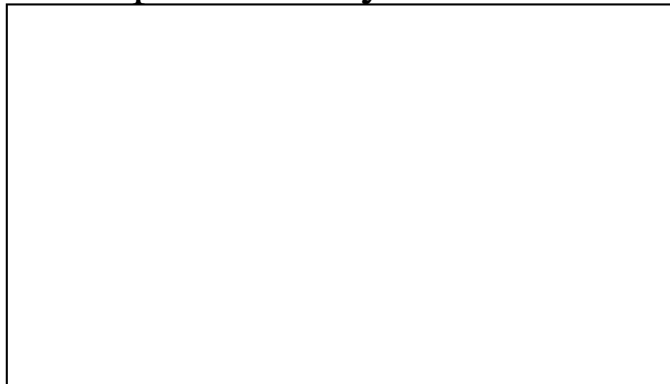
# SPECIFICATIONS

<b>Guard Level® Control Panel</b>	
Input/Outputs:	Max 32 input channels two-wire N.O./N.C or 4-20 mA
	32 digital output channels (optional plug-in card), current source
	COM A and COM B for V.D.R. connection or optional redundant displays for B.C.R. and E.C.R. COM C for configuration
Input Identification	User definable stick-on label
Safety Barriers	Up to 32 included within enclosure
Alarm Indication	Yellow LED for PRE-ALARM indication, flashing until alarm acknowledged and then turns steady. Goes out when liquid level is below 0.5M Red LED for MAIN-ALARM indication flashing until alarm acknowledged and then turns steady. Goes out when liquid level is below 2.0M 1 Red LED for common alarm, 1 Red LED for cable short circuit indication, 1 Red LED for cable break indication and 1 Red LED for power fail indication
Audible Alarm	PRE-ALARM pulsating buzzer, muted by ACKNOWLEDGE switch
	MAIN-ALARM steady tone buzzer, muted by ACKNOWLEDGE switch
Time Delay	User adjustable from 0-99 seconds
Status Indicators/ Alarm Blocking	1 Green LED for Power On
	1 Red LED to indicate alarm blocking + corresponding alarm point LED is turned on and flashes with unique frequency
	1 Red LED to indicate alarm delay is turned on
Alarm Relays	1 – Power fail relay (5A, 250VAC SPDT dry contact) 1 – Alarm /fault relay (5A, 250VAC SPDT dry contacts)
Power Supply:	110-240VAC
Power Fail Supply:	“Super Capacitor” giving 15 minutes power failure alarm. Activates power fail horn, LED and relay
Weight	Approx. 12.3 kg configuration dependent
Protection	IP42 NEMA 2
Dimensions	380mm x 380mm x 210mm/ Mounting holes, height is 400mm, width is 340mm
<b>WIAS-1A Cargo Hold and Void Space Sensor</b>	
Material	Polyethylene sensor body bonded on polyethylene cable (25M standard)
Alarm point accuracy	Separate sensors give the 0.5M and 2M alarm points
Gauging accuracy	+/- 5mm
Electrical Safety	Intrinsically Safe, Class 1, Div 1, Groups C&D (simple apparatus)
Power Supply	Loop powered, 9-30VDC 4-20mA
Output Signal	4-20mA, 2 wire standard
Shock & Vibration	MIL Spec
Weight	Approx 1.9 kg
Protection	IP67, NEMA4, Fully submersible
<b>Deck Junction Box</b>	
Material	Stainless steel 304
Flange connection	Universal DIN/JIS and ANSI (ND 50 / 2”)
Test port	Integral for in-situ testing of sensor / Test kit included
Cleaning port	Integral ¾” NPT for air-hose quick connect
Shipyards connection	Standard brass cable gland and wire hook-up on integral terminal block
Weight	Approx. 6.6 kg
Protection	IP67, NEMA 4

# *Sales and Service*



Represented By:



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