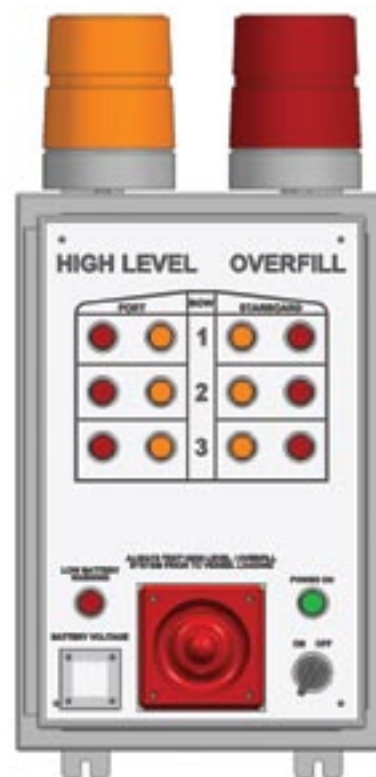


FIXED ALARM PANELS - APM-2 Operation of the APM-2 Audio/Visual Annunciator

The APM-2 tank barge liquid level annunciator panel is 24 VDC battery powered. A stainless steel NEMA/ EEMAC Type 4, 24"H x 16"W x 8"D enclosure houses all electrical components and the batteries are housed in a separate battery box. Although rated for outdoor use, these enclosures are not explosion proof and therefore must be mounted outside of the hazardous area on deck per 46 CFR 111. 105-3 1. More specifically, this panel must be mounted on the open deck a minimum of 10 feet (3 meters) away from the cargo area (vapor source). When mounted over the cargo compartments, the panel must be mounted at least 8 feet over the deck per 46 CFR 111. 105-3 1, K(2).

The APM-2 panel utilizes STAHL Model 9251/02 dual channel intrinsically safe repeater relays, which are UL, FM and CSA approved for intrinsically safe connection in Class I, II and III, Division 1 and 2, Groups A - G hazardous locations. The 8.2 VDC intrinsically safe sensing circuit, of the STAHL 9251/02, safely interfaces the annunciator panel with the normally closed reed switches, which are located in a hazardous location. The UL approved independently operating reed switches are float activated to open at 95% of tank capacity representing HIGH LEVEL ALARM condition and at approximately 98% of tank capacity representing OVERFILL ALARM condition. Each cargo tank is fitted with the aforementioned sensors (switches).

Outwardly, the panel annunciator light layout reflects the cargo compartment configuration with an amber and red light pair representing HIGH LEVEL ALARM and OVERFILL ALARM respectively for each cargo compartment. Additionally, amber High Level Alarm and red Overfill Alarm 2,000,000 C.P. strobe lights sit atop the panel. The front mounted audible alarms for both High Level and Overfill have a continuously rated sound level of 105 D.B. at 1 meter. An on/off rotary switch with power "on" light, battery condition voltmeter and red low power warning light are also located on the front of the panel.



APM-2-6

PHYSICAL DIMENSIONS

Panel	Weight	Size H - W - D
APM-2 - 3	51 lbs.	34" x 16" x 8"
APM-2 - 6	58 lbs.	34" x 16" x 8"
APM-2 - 8	62 lbs.	34" x 16" x 8"
APM-2 - 10	66 lbs.	34" x 16" x 8"
APM-2 - 12	76 lbs.	40" x 20" x 8"

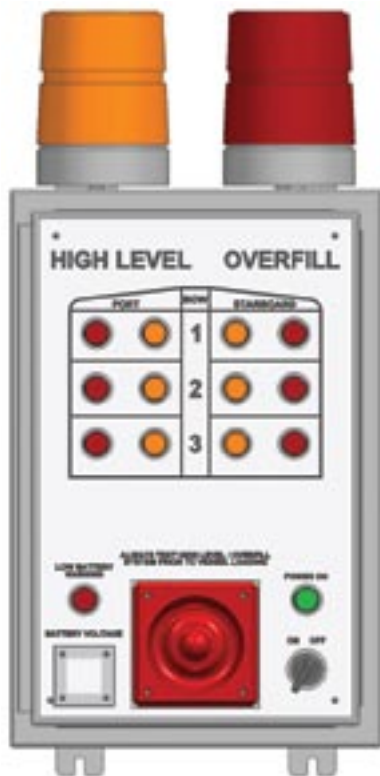
FIXED ALARM PANELS - APM-2

Operation of the APM-2 Audio/Visual Annunciator (Continued)

Panel operation is as follows.

When liquid level reaches 95% capacity in a cargo compartment, the high level sensor reed switch protecting that compartment opens, breaking the intrinsically safe sensing loop from its corresponding 9251/02 repeater relay. This relay turns on the amber High Level Alarm light showing which specific compartment has the 95% full condition. Simultaneously, the top mounted yellow strobe light begins to flash and the high level audible signal sounds. After an adjustable time period of approximately 5 seconds, the amber strobe light and high level audible signal will shut off, yet the amber individual compartment High Level indicator light will remain lit. When the first high level condition is achieved, the High Level series loop of dry panel contacts feeding pins L3 and N of the Hubbell 516B-IW Barge to Shore Receptacles open. If the barge is connected to a dock facility, which can accept this signal, the dock will immediately be aware of the High Level condition. In turn, each subsequent high level condition will be annunciated as describe above.

In the event liquid level reaches 98% capacity, simultaneously the individual compartment red overfill light will light, the red strobe light will light, the overfill audible alarm will sound and the barge to shore connection circuit indicating overfill alarm will open at pins L1 and L2, alerting the dock facility of the overfill condition if the facility has provisions to accept this signal. All of these system conditions remain until liquid level is reduced or the annunciator panel power switch is turned off. With panel power switched "off" or if the battery power fails, both High Level and Overfill conditions will be indicated at the barge to shore connection receptacles. If the annunciator panel power switch is "on" and battery power drops too low, to a value of approximately 20 VDC, the red low power warning light will come on and the barge to shore connection will indicate both High Level and Overfill conditions.



APM-2-6

During pre-transfer overfill system testing as required in 46 CFR 39.20(b)3, all system components are fully tested. During this system test, battery supply voltage is clearly 0-21 indicated and if supply voltage is less than 21 VDC, the two series connected 12 VDC gel cell batteries must be recharged or replaced with fully charged batteries. Approximately 50 hours of panel operation can be expected from a fully charged battery set. As an option, solar modules can be provided to recharge the batteries on the barge making the power supply maintenance free.