

The logo for API Marine, featuring the letters 'A. P. I.' in a bold, sans-serif font, with 'm a r i n e' in a smaller, lowercase font below it. A thin white arc is positioned above the letters.

A. P. I.
m a r i n e

API Marine

SENSOR PRESENTATION

Mission critical applications in harsh environments

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API Marine

Acoustic Precise Instruments

Development, design & production of advanced tank sensors and automation systems for marine applications



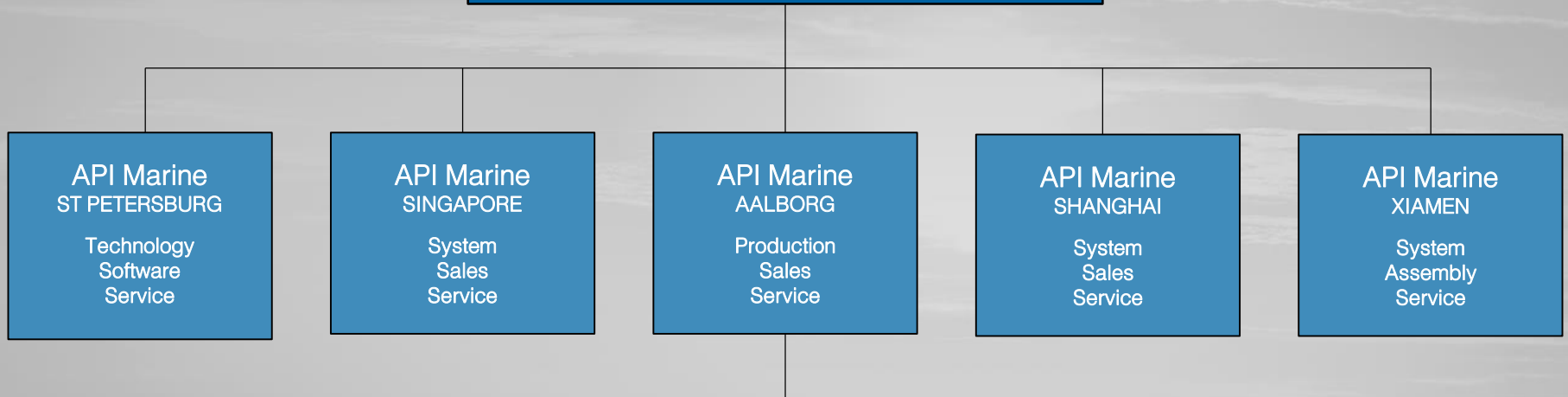
About API Marine

An independent manufacturer of **sensors** and
automation systems

All sensors & systems are developed and
manufactured **in house**

Patented technologies





API Marine Product Range



Unique Sensors, Transmitters & Switches



Control and Alarm Systems



Integrated Automation System



Valve Remote Control System



Loading and Stability Software

Designed and Made for all Types of Vessels

Container Vessels



- Remote Sounding System
- Loading Stability Software
- Valve Remote Control System
- Advanced Sensor Package

Bulk Carriers



- Remote Sounding System
- Loading Stability Software
- Valve Remote Control System
- Advanced Sensor Package

Oil & Chemical Tankers



- Integrated Automation System
- Cargo Tank Monitoring System
- High Level & Overfill system
- Remote Sounding system
- Valve Remote Control System
- Loading Stability Software

Floating Docks



- Remote Sounding System
- Hydraulic Deflection System
- Loading Stability Software

LNG Fuel Tanks



- Advanced Sensor Package

API Marine Product Range



High quality and **reliable** automation systems start with good sensors

Designed and manufactured for **marine applications**

Sensors for Critical Applications in Harsh Environments



Arctic Applications



LNG Fuel Storage Tanks

API Marine Sensors



High Quality Sensors for Marine and Industry

TGD SERIES

TGD™ Tank Gauging Device (Level, Pressure & 3 x Temperature)

TGD-R™ Tank Level Radar

TGD-L™ Tank Gauging Device (Level)

TGD-TP™ Tank Gauging Device (Temp/Pressure)

LEVEL SWITCHES

UTS™ Ultrasonic Tank Switch

TLA™ Tank Level Alarm (95%/98%)

TRANSMITTERS

UPT™ Universal Pressure Transmitter

UTT™ Universal Temperature Transmitter



UTS™

Ultrasonic Tank Switch



- Works on the principle of acoustic waves in a metal rod
- Unlimited number of versions available
- Technology patented in Europe, USA and Japan
- Works with any liquid

UTS™

Ultrasonic Tank Switch



Advantages

- No moving parts & no electronics - ONLY steel inside the tank
- Temperature range from -200 to +450° Celsius
- High pressure - up to 200 bar
- Extended length and flexible rod
- Easy service and low maintenance cost

UTS™

Ultrasonic Tank Switch



Application Advantages

- Ideal solution for LNG applications - **Low temperature**
- Tank farms or other applications where **extended length** is required
- Power and energy production where **very high temperature** occurs
- Tanks with **high pressure**

UTS™

Ultrasonic Tank Switch

Technical Characteristics and Specifications

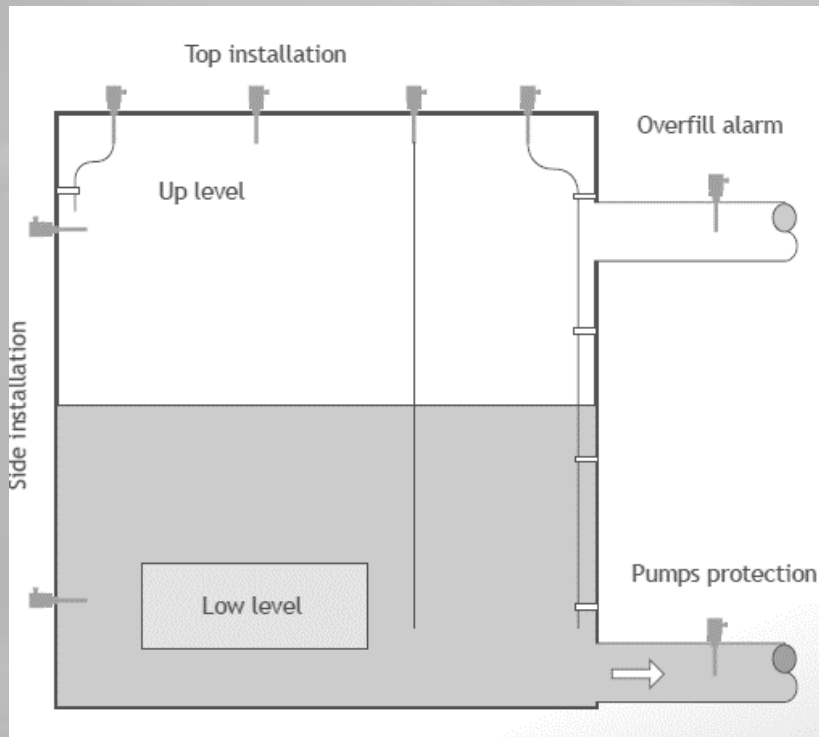


Current output (2 wire)	7mA / 14mA
Relay output (4 wires)	NO/NC
Repeatability	Top mounting < 3 mm Side mounting < 1 mm
Supply voltage	11 - 30V DC
Ambient temperature	-55 ...+85° C
Product temperature	-200 ...+450° C
Storage temperature	-55 ...+90° C
Protection rating	IP65 or IP68
Working pressure	Std. up to 40 bar (special version up to 400 bar)
Shock test	1000g peak
CE marking	EMC according 89/336/EEC amended by 93/68/EEC
Approvals	ATEX Ex II 1 GD EEx ia IIC T5/T6



UTS™

Ultrasonic Tank Switch



- Tanks, Plants, Pipelines Reservoirs etc.
- High level alarm, Low level alarm
- Pump protection
- Any direction for mounting
- Any temperature

TLA™

Tank Level Alarm



- Sensor for High Level & Overfill Alarm (95%/98%)
- Works on the same principle of UTS™
- Proven and reliable solution
- Virtually no maintenance
- Low cost of ownership
- Can be adapted to most makers of High level / Overfill alarm system

TLA™

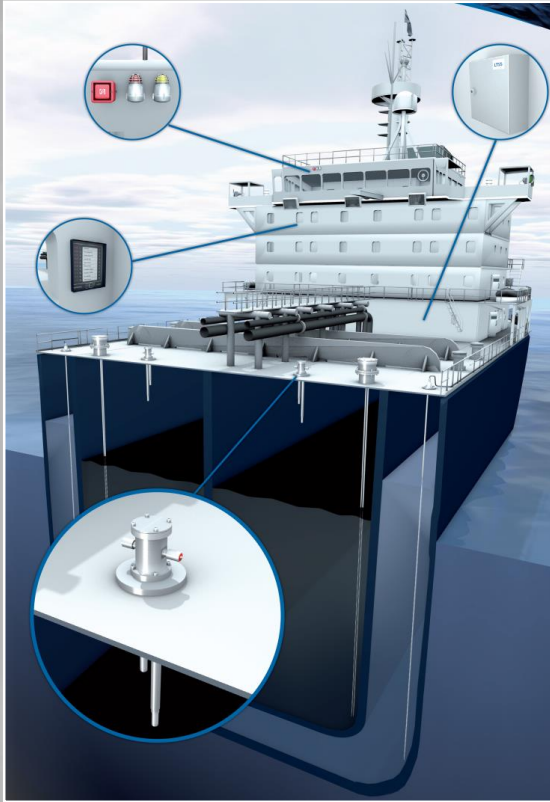
Tank Level Alarm



- Alarm actuation when liquid level reaches set high and high-high levels
- Works with any type of liquids and liquefied gas
- No electronic inside the tank
- Not sensitive to vapor, moisture and foam
- Lengths and process connection on request
- EEx ia II T6 ATEX Approval

TLA™

Tank Level Alarm



- TLA™ is an integrated part of the API Marine TSS/Alarm™ High level & overfill alarm
- Can be adapted to any maker of High level/overfill alarm system
- No moving parts inside the tank
- **Ideal solution for older and outdated sensors** (e.g. floating devices which require regular replacement)

UTT™ / UPT™

Universal Temperature & Pressure Transmitter



- Robust, ruggedized and reliable
- Designed for harsh environment, where other manufacture falls short
- Competitive solution for replacement of other high end products

UPT™

Universal Pressure Transmitter



- Detection and measurement of pressure in tanks and pipeline installations
- Level measurement (hydrostatic method) in service, ballast and slop tanks
- Absolute, relative, differential and barometric types
- Cable on request for IP68 version
- Ex ia IIC T4 ATEX approved

UTT™

Universal Temperature Transmitter



- Detection and measurement of pressure in tanks and pipeline installations
- Level measurement (hydrostatic method) in service, ballast and slop tanks
- Absolute, relative, differential and barometric types
- Cable on request for IP68 version
- Ex ia IIC T4 ATEX approved

TGD-R™

Tank Level Radar



- Applicable for oil, product & chemical tankers
- Non-contact measuring, no wear and tear
- High accuracy 0,1%
- Smaller measuring dead zone
- Customized variations
- Easy installation & maintenance
- Measuring range 0-35mm

TGD™

Multifunctional Tank Gauging Device



Accurate Measurement of:

Level

Temperature

Pressure

TGD™

Multifunctional Tank Gauging Device



- TGD™ for measurement in Oil & Chemical Tanks
- Non-contact level gauge with high accuracy
- Automatic self-calibration
- 2-wire connection
- Multi-point temperature profile in tank
- Inert gas pressure sensor built in

TGD™

Multifunctional Tank Gauging Device



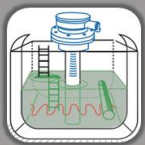
Patented principle of Guided Low Frequency (GLF™) wave propagation allows equally precise accuracy of measurements along tank height with any shape of tank and type of liquid

Guided Low Frequency Principles

- GLF™ technology measures difference in density between air and liquid
- Tank geometry does not affect the signal thanks to GLF™ wave technology
- GLF™ wave method secures equal accuracy for the whole tank - from top to bottom
- Does not require calibration
- Automatic calibration waveguide with accuracy of 1mm every 2 sec
- GLF™ wave technology is not affected by foam

GLF™

Guided Low Frequency Advantages



Measurements not affected by other equipment in the tank



Reduced number of sensors required in the tank



Possibility to bend



Not affected by foam and sloshing

Advantages and cost savings for shipyards

- Flexibility of mounting / positioning TGD™ in tank / on tank top
- Easy to arrange construction in slop tanks
- Less cabling - only 2 wires
- Less protection pipes, painting and installation
- Only one deck penetration for level / pressure / temperature sensor
- Less calibration
- Less time for commissioning



TGD™

Multifunctional Tank Gauging Device



Patented principle of Guided Low Frequency (GLF™) wave propagation allows equally precise accuracy of measurements along tank height with any shape of tank and type of liquid

TGD™

Multifunctional Tank Gauging Device



- Non-contact level gauging device with accuracy of ± 2 mm
- Automatic self calibrating
- HART 2-wire connection
- For tanks 0-30 meter
- 42mm pipe in tank (in 2 meter sections)
- Ex ia IIc T4-T6 ATEX Approval

TGD™

TGD™ For LPG / LNG Applications



- Unique dual-functioning LPG/LNG Tank Gauging Device
- Liquid level measurement & vapour stratification
- Temperature profile & pressure
- Acoustic non-contact Guided Low Frequency self-calibrating method (GLF™)



Reference Projects

Chemical Tankers

8500 DWT: 4+4+2+2 Vessels - ABS Class

13000 DWT: 2+2+2+2+2 Vessels - BV Class

Shipyard: Tongbao Shipbuilding (Nantong)

Shipowner: Dinheng Shipping



Reference Projects

Chemical Tankers

API Scope of Supply:

- Cargo Tank Monitoring System
- High Level & Overfill Alarm System
- Remote Sounding System
- Valve Remote Control System
- Loading Computer



8500DWT (4+6) Stainless Steel Chemical/Product Oil Tanker

- Class: ABS
- Cargo hold material: Duplex 2205
- Cargo & slop tanks capacity: 9500m³



13000DWT (4+6) Stainless Steel Chemical/Product Oil Tanker

- Class: BV
- Cargo hold material: Duplex 2205
- Cargo & slop tanks capacity: 15000m³

References

Shipowners & Clients



References

Shipowners & Clients



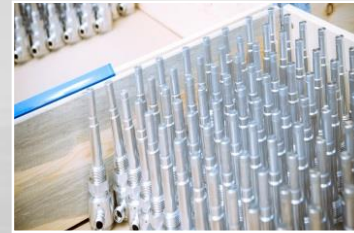
YARDIMCI



CIMC RAFFLES



Production



Production



API Marine Integrated Solutions Advantages

Flexible dedicated factory for **automation systems**

Independent supplier of sensors and solutions, with all competencies under the same roof

All products designed and manufactured for **maritime** applications

API Marine



- Solutions for harsh and demanding environments
- Sensors approved for Winterization / Iceclass 7 applications
- High reliability & robust design



Certificates & Type Approvals

- ISO9001:2008
- ATEX and IECEx
- Most Marine Class Approvals
- FAT (on request)



API Marine



Quality
Reliability
Safety





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