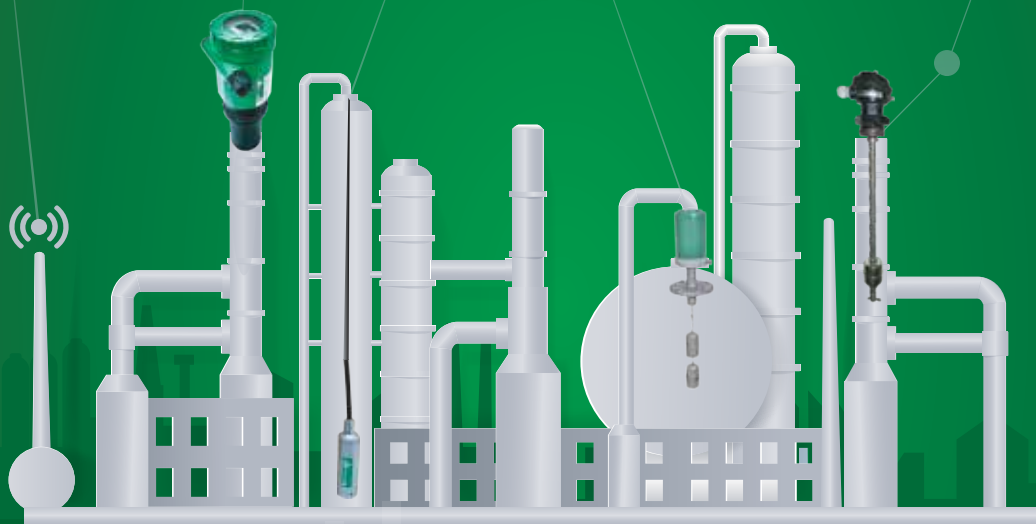


THE TOMORROW OF PROCESS CONTROL

Automation in Level Measurement



POWERED

BY

Techtrol 

Innovating Level Controls Since 1984

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NANDLAL KHATAN

Managing Director

A sophisticated automated system is the need-of-the-hour in many industries across the globe. It has become mandatory for the manufacturers to have an accurate solution for performing tighter process control mechanisms and an improved sense of technology that would minimize human error.



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Automation: The Tomorrow of Level Measurement

Our Proposal

Augmenting requirement of reliable instrumentation in industries has made us bring in an initiative, where we plan to create a platform for researchers, industrialists, and stakeholders to equip themselves, and also discuss their share of aspects, regarding Level Measurement.

I am delighted to inaugurate this booklet comprising of a well-planned and comprehensive outlook of Level Measurement and other related technology in the field of automation. The booklet encompasses a large variety of details regarding products that use the principle of level measurement such as level gauges, switches, foam detectors, temperature sensors, radar and laser level transmitters, and other auxiliary products.

The Future

Level Measurement is integral to process control. There are industries and individual companies requiring cutting-edge level monitoring of entire systems providing accurate measure of fluid level. Older industrial Level Measurement devices had faced catastrophic failures. They were soon replaced by modern technology, emerging the use of computers to perform calculations and maintain processes. With more and more complex principles getting appended, better control systems materialized providing more expected on-time results.

Pune Techtrol is a crucial provider of excellently designed and enhanced custom-made tools for upgraded solutions in automation processes. A place where innovators and engineers are working towards revolutionary research in Level Measurement every day!

Together, let us can make this a success! Looking forward to your unhesitant feedback!

IIoT Based Applications in Level Measurement

The Internet of Things refers to interconnected devices, tools, machines, and even animals or people that are all enabled via electronics to collect, share, and exchange data and information. In Industry, the IIoT brings together intelligent machines connected by wireless communications technologies with people and data. It allows exponential amounts of data on virtually anything that occurs in a plant to be collected, analyzed, and used to drive faster, more meaningful business decisions. It has a dramatic impact on the operational efficiency and productivity of industries worldwide.

Level Measuring Instruments

Water plays a very crucial role for sustenance of human life and needs to be maintained effectively. Water control has already become a significant part of 'Internet of Things'. Techtrol liquid level sensors are employed in a number of IIoT applications highlighted here under.

- **Potable Water Monitoring:** With increase in population, the need for accurate tracking of potable water level has become very important and has to be effectively monitored. Techtrol liquid level sensors can be used for accurate monitoring of level in tanks, reservoirs and vessels.
- **Surface Water Level Measurement:** Drought and flooding are two of the most

devastating ecological disasters that can befall on any human & animal population.

We need to be prepared to face either eventuality. Water level is important for monitoring of drinking water & planning of agriculture and irrigation. Many government agencies and smart cities have installed flood warning systems which use IIoT sensor devices to provide safety for communities

- **Industrial Automation:** Now a days, most process industries rely on automation to cut costs and improve efficiency. In process industry, level measurement and its control rely on level sensors, which are connected wirelessly to a computer control station to function. These IIoT level switches/

transmitters provide prior intimations of breakdowns, monitoring of critical applications, unmanned level control, stock level records and reports all cockpit solutions at desk for the most important parameter — LEVEL.

- **Other IoT Applications:**

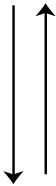
Wastewater management, chemical leak detection, pollution monitoring, oil and gas monitoring, flood/dam/ reservoir level monitoring, fuel level monitoring, tracking of commercial vehicles and fuel theft.



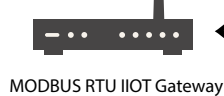
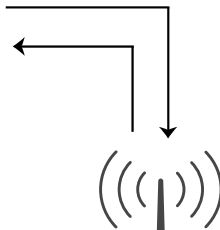
CUSTOM SEMI CUSTOM



Cloud Database



Secure Remote Access



MODBUS RTU IIOT Gateway

RS485 connection

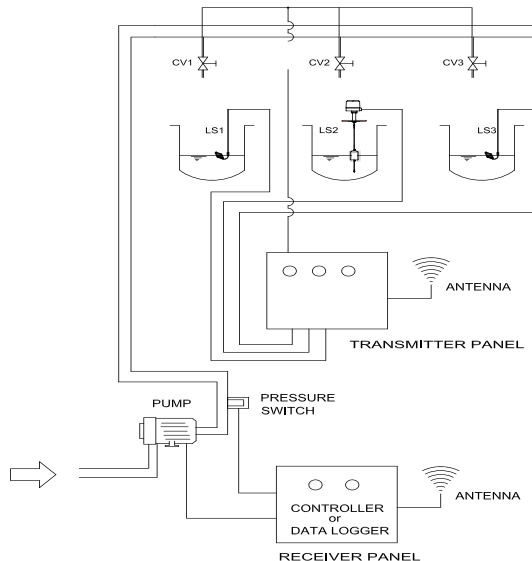


Level Switches & Transmitters

Techtrol Empowerment in Level Measurement with Automation & IIoT

With advancement in communication technology & internet, the usage of mobile is not restricted to communication alone, but its applications have reached to a level, where machine data & process parameters are communicated to provide remote controlled action from any corner of the world.

Besides IIoT, technology has improved efficiency & communication of these operations. It connects various sensors from process tanks & machines to each other and the operators and service providers. It provides real time data and critical analysis to take corrective measures.



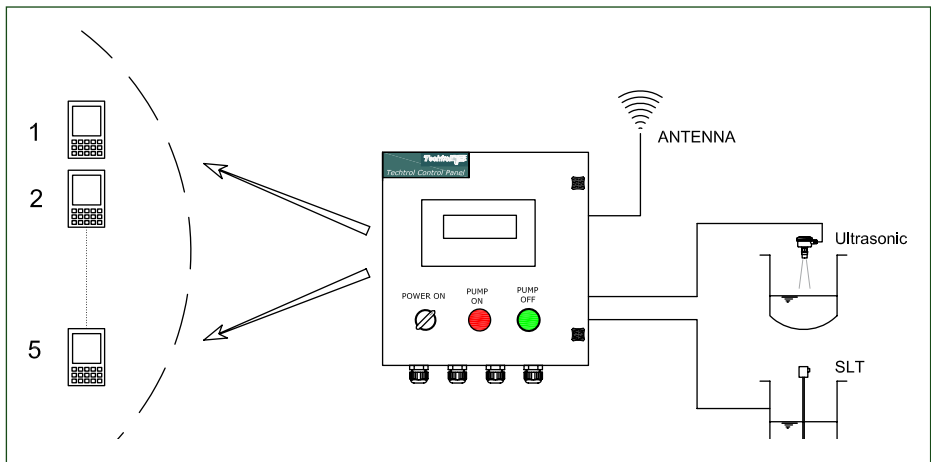
The fundamental requirement of an automation system are the field instrument sensors, which performs the role of eyes and ears. These field instruments are designed and manufactured by Pune Techtrol and their multiple products can be employed by connecting them to GSM, M2M convertor, Web based monitoring systems, telemetry & other IIoT systems.

Features

- Wide range of level switches and transmitters to interface with IIOT systems
- Utilizes easily available global network
- Reliable and cost-effective solution for remote monitoring and efficient control of parameters
- Provides analytical tools, trends, bar graphs, pi charts to take corrective measures.
- Data can be downloaded in .xls and .csv format
- Customized solutions to suit individual applications
- Options of data logging, SCADA connectivity, SMS alert for alarms and level data monitoring

Pune Techtrol has successfully installed automation & monitoring systems with GSM for following applications:

1. Level Monitoring and Pump Control of process tanks
2. Dam Level Monitoring
3. Flow Discharge Monitoring in Canal
4. Flood Level Monitoring
5. Automatic Water Level Recorder
6. Tank Farm Liquid Level Monitoring
7. Reservoir level monitoring
8. Fuel level monitoring for mobile vehicles



GSM based Tank Farm Monitoring System at Gulati Oils, Jammu

It continuously monitors oil level and its volume in 6 tanks through ultrasonic transmitters which transmit data through GSM network to 5 authorized users for remote monitoring. It comprises of 6 Techtrol ultrasonic transmitters (noncontact type) wired individually to 6 Techtrol Indicating Controllers (TUIC), fitted on a control panel holding M2M convertor & GSM module to provide oil level indication in each tank through LCD display. This data is transmitted through SMS to as many as 5 authorized cell phones at regular intervals. This time interval of "SMS Alerts" and number of cell phones upto 5 max, alongwith cell numbers are programmable and can be altered through keypads provided on the controller.

Features

- Uses easily available global network of GSM
- Provides SMS alerts for alarms and oil level at regular intervals or as per request
- Reliable and cost effective solution for real time level monitoring remotely
- Customized solutions to suit individual applications
- Option of data logging and SCADA connectivity



Successfully running for more than 6 months



Oil Tank 1
Oil Tank 2
Oil Tank 3
Oil Tank 4
Oil Tank 5
Oil Tank 6

The above system has been successfully working at Gulati Oils Pvt. Ltd, Jammu for more than last six months.

Remote Water Level Monitoring for Dams

Reservoirs created by dams provide water for activities like agriculture irrigation, human consumption, industrial use and many such applications. Hence water level in dams is required to be regularly monitored for monthly supply of water discharge to users and to take timely decisions & actions during low/ heavy monsoon.

Pune Techtrol's Monitoring System allows users to keep a close watch on water resources through cell phones remotely using GSM network and to speed up response time for timely action. The system consists of INTROL Radar Transmitter of 80 mtrs range installed as a field instrument above the dam water which is wired to GSM-based control panel installed in the control room. The control panel houses Indicating Controller (TUIC) along with data-logger and USB connector to store data in memory chip. The indicating controller continuously displays the reservoir

level & its volume through day & night without any disruptions and simultaneously storing this data in a memory chip at regular intervals. Hence the system also provides daily/ weekly/ monthly records of water level for further analysis & planning. Moreover, it sends SMS alerts about the reservoir storage level and its volume to 5 authorized cell phones at regular intervals through GSM network. This time the interval of "SMS Alerts" and number of cell phones upto 5 max, along with cell numbers are programmable and can be altered through keypads provided on the controller.

Features

- Uses the easily available global network of GSM.
- Provides SMS alerts for alarms and oil level at regular intervals or as per request.
- Reliable and cost-effective solution for real-time level monitoring remotely.
- Customized solutions to suit individual applications.



Techtrol Open Chanel Flow System- TOCF

A versatile, non-contact type system to measure flow rate and total flow of liquids flowing through an open channel, fitted with flumes or weirs.



- The system consists of a display unit to indicate instantaneous/ total flow, wired to an ultrasonic transmitter to measure head height.
- The ultrasonic transmitter should be mounted at a correct distance upstream from the primary element, where liquid surface is fairly stable and has uniform flow velocity.
- The 4-20 mA output from transmitter is fed to the display unit having integrated 'Level to Flow' equation corresponding to various primary elements and display 'Flow Rate & Total Flow' on LCD.

Features

- Reliable, cost-effective and easy to install
- Displays instantaneous flow & total flow with re-transmission output (optional)
- Easy to program & calibrate along with password protection
- Retains memory during power interruption

Applications

Thermal Power Plants:

- To measure the total flow of raw water from the reservoir to estimate consumption.
- Measurement of water flow from cooling towers to calculate efficiency and waste heat balancing.

Hydro Power Plants:

- To measure turbine discharge delivered for irrigation projects.
- For custody transfer /billing of water released to agriculture by rural water supply boards.

Sewage Treatment Plant (STP)-

- To measure flow at the inlet as well as the outlet to calculate the efficiency of STP.

Waste Water Treatment Plant (WTP)

- To measure intake of waste water for records and assessing production plant efficiency.

Common Effluent Treatment plant (CETP)

- To regulate total flow of effluent discharge and to allocate effluent treatment expenses to polluting industries like Chemical, Fertilizer, Quarry & Paper to curb environmental pollution.

Non-Contact Laser/ Distance Transmitter for Solids



Laser Transmitter provides continuous level measurement of granular materials and opaque liquids.

Accessories



It uses high-speed laser pulses which are transmitted towards the surface and reflected pulses are detected by a sensitive optical receiver. Transit time between transmitted and received pulse is directly proportional to the distance.

Salient Features

- Measures minimum distance of 0.1mtrs to maximum of 100mtrs.
- High accuracy 0.1 % FS.
- Fast response of 0.1 sec.
- Suitable for low dielectric material where radar fails to perform.
- Narrow beam permits measurement through small inlet opening.
- 4-20mA O/P and relay for continuous monitoring & control action.
- User friendly programming through push button
- Handheld programmer for remote calibration
- IP 65 enclosure with local LCD display
- Option of ATEX /IA enclosure for hazardous area
- Option of dust tube to prevent dust deposition on laser lenses
- Competitively priced

Introduction to Foam Detection Control System

During the production process, foam has an undesired side-effect of mixing, usually slowing down the production process and difficult to fill vessel with the correct amount of liquid. In addition, it increases product wastages and degrades quality of end product. Few level instruments detects foam depending on its conductivity and density, are not reliable. Most instruments gets confused by foam which makes their readings unreliable.

Techtrol Offers the systems consisting of foam sensor alongwith control unit can detect the presence of foam and if necessary also measure the level of the foam above the liquid.

Features

- Reliable performance for aqueous and non-aqueous foam.
- Discriminate between the residual deposits of foam and product build-up on the sensor and the foam being created in the process.
- The controllers can be programmed to give analogue or digital outputs to start and stop dosing pumps to control the foam accordingly with anti-foaming agents.



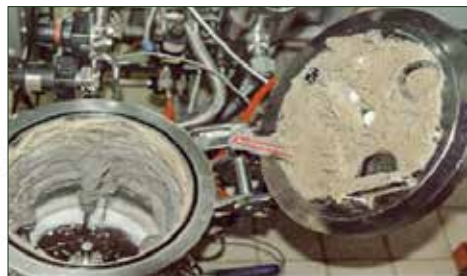
Advantages

- Maximum Sensitivity to Foaming
- Minimum Vulnerability to Fouling
- Reduces Anti Foam Use
- Increases Batch Sizes
- Reduces Down Time
- Measure Foam & Liquid Simultaneously
- Unique Design

Applications

Minerals Processing & Mining, Waste Water Treatments, Paints & Coatings, Food Processing, Pharmaceuticals, Sugar factories, Breweries, Biotech, Fermentation, Chemicals, Oil & Gas, Transport, Bio-Fuels, aqueous & non Aqueous paints & coatings.

This photograph shows a Fermenter which is coated with product. The close-up picture of the sensor, seen arrowed protruding from the head plate, shows it to be completely covered with material but it was still working when the vessel was opened.



How to prevent Overfilling by Level Measurement and Control?

Overfill is an outflow of stored material. Hence liquid in tanks and free flowing solids in silos need to be monitored & controlled to prevent their overflow and subsequent loss.



FLOAT GUIDED SWITCH

Is a top mounted switch based on Archimedes principle of floating body. The float actuates a switch magnetically at a preset level point of liquids. It is available for single or multiple switchings upto four levels.

TECHTROL BILGE SWITCH

It is a miniature float switch mounted inside a perforated cage to prevent suspended particles from hindering the float movement in liquids. It is provided with an extension cable of required length to detect corresponding preset level in bilge tanks on ships. It is IRS class approved for marine applications and suitable for single switching.



Besides, if the medium in question is flammable, it can cause severe damages to physical assets, environment and human beings, which can be prevented through overflow control alongwith savings in cleanup cost and downtime.

Level switches are installed on the tank at high-level preset point, to detect presence of material and actuates the auxiliary device to stop inlet flow. Level transmitters are installed on tank to provide



FLOAT PIVOTED SWITCH

It is a side mounted switch for single switching, based on Archimedes principle of floating body in liquids. The float magnetically actuates a switch at preset level.

DISPLACER SWITCH

It is top mounted switch based on Archimedes principle of submerged body in liquids.

The switch is magnetically actuated due to upward buoyant force exerted by the displacer at preset level. It is top mounted and available for single or multiple switchings



a continuous level indication of material in the tank from bottom to top through a generated signal of 4-20mA at preset level. At the preset level, a signal is transmitted to actuate auxiliary device and stop inlet flow.

CAPACITANCE SWITCH



It is based on the principle of capacitance formed by the liquid between two electrodes at preset level. It is top mounted and available with site adjustable single or multiple switchings.

VIBRATING FORK SWITCH

It is made to vibrate through by powering piezo electric crystal. The vibrations are dampened when it comes in contact with material at preset level which in turn effect a change over in contacts for control action. These are point level switches for liquid as well as free flowing solid. They can be top or side mounted angularly.



ROTARY PADDLE SWITCH



It is based on a low speed synchronous motor rotating a paddle. The rotary motion is stopped on coming in contact with free flowing solids, which in turn effect a change over in contacts for control action.

HYDROSTATIC TRANSMITTER

It is based on hydrostatic pressure of liquid level to provide 4-20mA output. It is available in two versions. One is top mounted and submerged into liquid and other is side mounted externally to the tank wall.



ULTRASONIC TRANSMITTER



It is top mounted, does not come in contact with service medium and provides continuous output for control action. It works on 'Time of Flight' principle using the speed of sound.

GUIDED WAVE RADAR

It is top mounted, does not come in contact with service medium and provides continuous output for control action. It works on periodic linear frequency variation of transmitted electromagnetic signal which is reflected on measuring surface received with time delay.



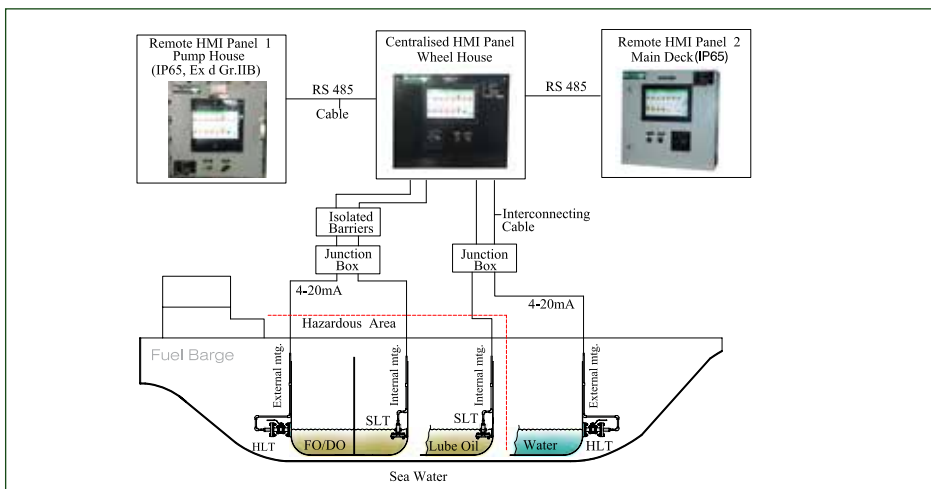
Marine Tank Content Gauging System - TCGS

This system is specially designed for monitoring liquid level, volume and weight in multiple tanks on barges, ferries and offshore industries for services like fuel, lube oil, water tanks, bilge holding tanks and any other non-corrosive mediums.

The System is available in three configurations depending on number of tanks. 1) TCGS 8: 1 to 8 tanks, 2) TCGS 16: 1 to 16 tanks, 3) TCGS 24: 1 to 24 tanks. The system consists of hydrostatic level transmitters in SS316 construction with IP68 protection and one centralized & two remote HMI displays. Change in liquid level is sensed by the transmitter and generated signals are processed through sophisticated microprocessor based electronics and displayed as level, volume & weight in animated & numerical format including high/low level alarms on HMI display. Display parameters such as tank nomenclature, alarm set points, brightness control can be changed through touch screen keys on HMI. For hazardous areas, hydrostatic pressure transmitters are provided with isolated zener barriers for intrinsic safety and HMI display is fitted in Ex-proof enclosure.

Features

- Animated Tank Level with Alphanumerical Display with High/Low Alarms
- User-friendly Touch Screen Operations with Brightness Adjustment for Display
- IRS Class Certified Gauging System with IP68 Transmitters to suit Marine Environment
- Intrinsically Safe Transmitters for Hazardous Areas (Isolated Barriers)
- Remote Tank Levels in Weather proof or Ex- proof Panels.
- Customized Tank Gauging Solutions



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ALL THE WAY**

WORLD FERTILISER LTD. RAIGAD, MS
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GB' ON BOILER DRUM AT
HERMAX LTD., PUNE, MS
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WATER AT RAZ BOILERS 'MLG'
VT. LTD. SANGALI, MS | FBG FOR GMANN
DIESEL TANK AT CUMMINS INDIA
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We have a unique approach to drive the landmark work established in the field of automation, across the country. With efficient business process and excellent service, Techtrol has given an unprecedented access to quality and precision. The right combination of a long-term philosophy and solutions in level measurement allow us to showcase our on-field installations.

WE MEASURE THE BEST FOR YOU



WE MEASURE THE BEST FOR YOU

COMMITTED EXCELLENCE TOWARDS CUSTOMER SATISFACTION

50++

Certifications
& Approvals

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Innovative
Products

CUSTOMERS

MAGNETIC FLOAT GUIDED LEVEL SWITCH

TECHTROL LEVEL INDICATOR

CONTROLLER COUNTER & TOTALISER T-SCN

REFLEX FLAT GLASS LEVEL GAUGE - RFG

TWIDS MAGNETIC FLOAT PIVOTED LEVEL SWITCH

HARSH APPLICATIONS WATER ALARM GADGET

LEVEL MEASUREMENT TANK MONITORING

TTMS TECHTROL FULL VIEW SIGHT GLASS

TAPS HYDROSTATIC LEVEL TRANSMITTER WATER ALARM GADGET

MINI FLOAT GUIDED LEVEL SWITCHES CALIBRATION POT - TCP

MINI FLOAT PIVOTED LEVEL SWITCHES FOR LIQUIDS

TRANSMITTER

LASER LEVEL / DISTANCE TRANSMITTER RITIMEN FLOAT - FLB FGSO

TANK CONTENT GAUGIN

THERMOCOUPLE (IN

GUIDED WAVE RADAR

GAUGES ULTR

ULTRACOMP



ACW RADAR TRANSMITTER

LITY PUMP G-TROL

E TRANSMITTER THERMOWELL

FOR HAZARDOUS AREA

TER - ULTRACOMP

ULTRASONIC (NON CONTACT) LEVEL TRANSMITTER

ULTRASONIC LEVEL TRANSMITTER

SURESENSE FOAM CONTROL - DI FOAM

FOAM DETECTORS

VIBRATING DIAMOND BLADE MINI TUBULAR LEVEL GAUGE

CABLE SUSPENDED TLT SWITCHES

DISC RF ADMITTANCE TELS MAGNETIC FLOAT OIL GAUGE

DRFA MINI DIPSTICK GAUGE

VERTICAL LEVEL CONTROL SWITCHES

BI-COLOR MULTI PORT LEVEL GAUGE

DIPSTICK GAUGE COMPACT MAGNETIC LIQUID LEVEL GAUGE

CMLG

WELD PAD LEVEL GAUGE

MFCG MAGNETIC LIQUID LEVEL GAUGES

TRANSPARENT FLAT GLASS LEVEL GAUGE

TUBULAR LEVEL GAUGE OIL LEVEL GAUGE

INNOVATION REFLEX FLAT GLASS LEVEL

COMMITMENT

TRUST

RESPONSIBILITIES

PRODUCT

DIVERSITY

RESPECT

UNITY STRENGTH

PEOPLE

NETWORKING

AWARENESS

BRAND DESIRE

GROWTH APPROACH

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