



RELI®



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RELI®

Smart Water Pressure Monitoring Terminal P11



Highlights

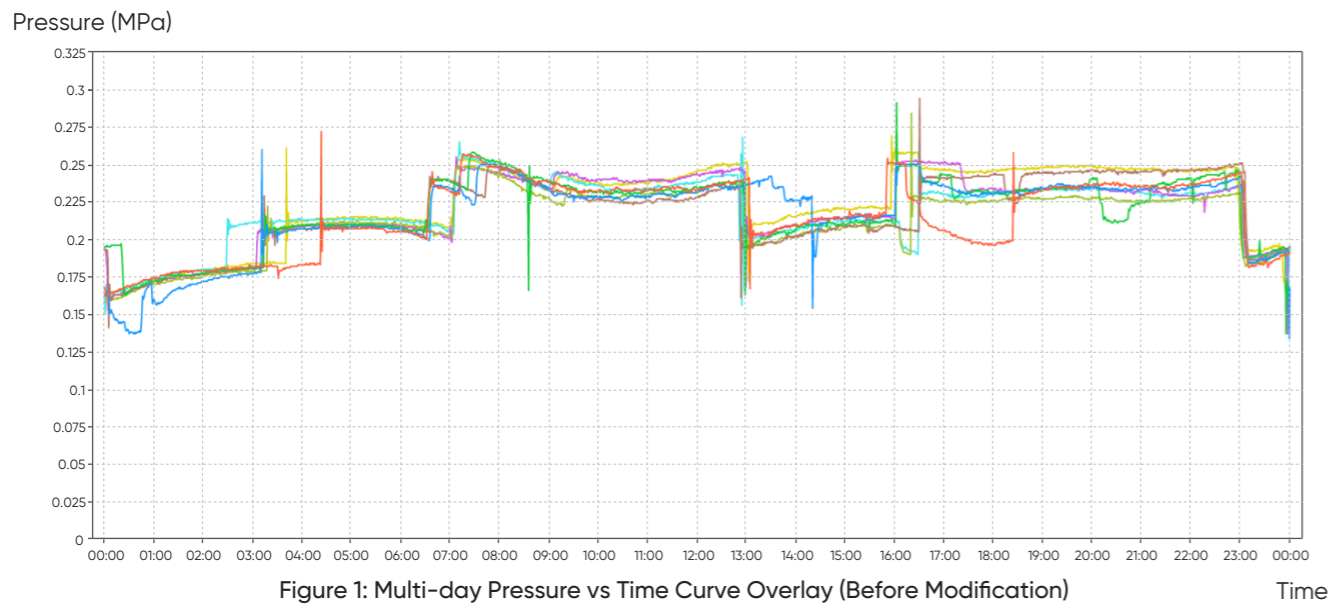
- Supports monitoring transient pressure and water hammer in the network with a maximum measurement resolution of 10ms
- Easy to install, no water cut-off needed, no on-site welding required
- Optional integrated battery design with a battery life exceeding 6 years
- Wide measuring range, up to 4.0 MPa

In Reli you can trust

P11 Driven Pressure Optimization

Hazards of Water Hammer Effect

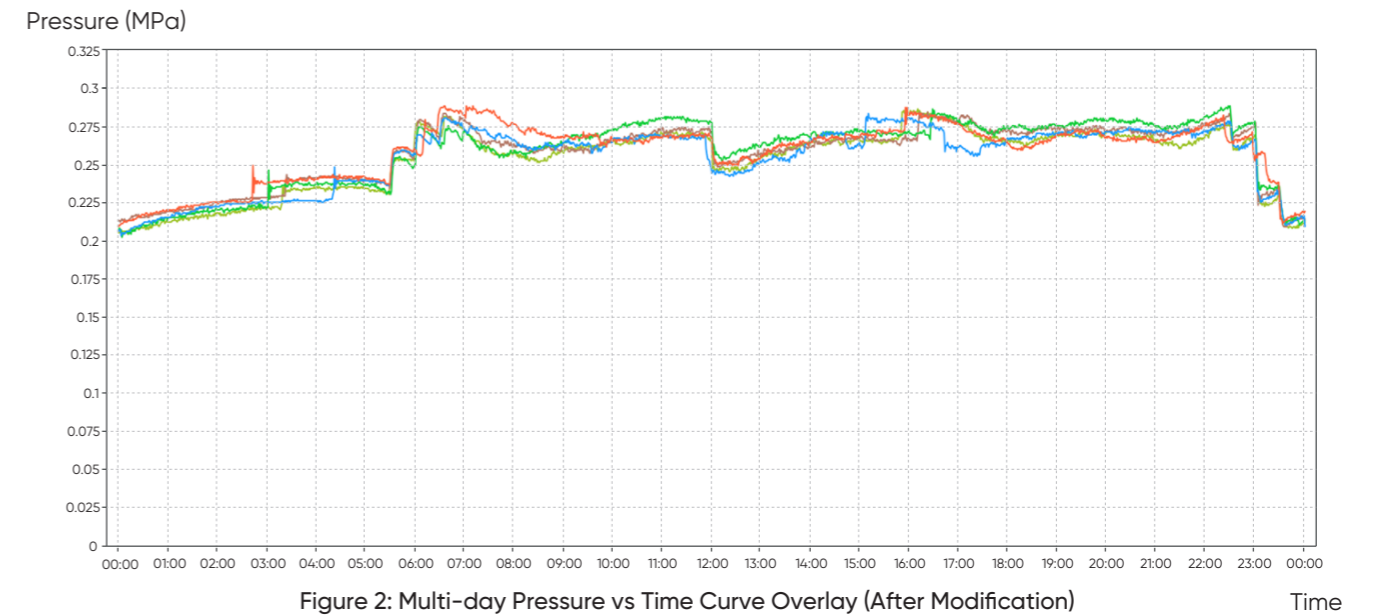
- Causes severe vibrations in pipelines and disconnection of pipe joints.
- Damages valves, and excessive pressure may lead to pipe ruptures.
- Triggers pump reversal, damages equipment or pipelines in pump houses, and in severe cases, causes pump house flooding.



After using P11, customers observed frequent large-amplitude transient pressure spikes in the system (as indicated by the peaks in Figure 1).

Causes of Water Hammer Effect

- The total head or operating pressure of the water pump is too high.
- The water flow velocity in the conveyance pipelines is too high.
- The conveyance pipelines are excessively long and the terrain varies significantly.
- Sudden opening or closure of valves.
- Single-pipe water transport to higher elevations.
- Non-standard construction practices may introduce latent risks to pipeline systems.
- Sudden startup or shutdown of pump units.



Through technical analysis, we recommended adjusting water plant pressure operations from a "one-time full adjustment" to a "three-step incremental adjustment," reducing the magnitude of each individual adjustment to mitigate pressure fluctuations. Additionally, we advised extending the acceleration/deceleration time of pump station water pumps to control the frequency of peak occurrences.

Following these adjustments, large-amplitude transient pressures were essentially eliminated, and the overall system pressure stabilized (See Figure 2).

Highlights

1

Transient Pressure Monitoring

Transient pressure is characterized by sudden pressure fluctuations within pipelines, typically less than 100ms. Conventional pressure sensors are limited to 1Hz sampling rates which struggle to capture these transient events.

The P11 monitoring system provides **up to 10ms measurement resolution**, supporting real-time detection of all pressure transients.

P11 facilitates systematic identification of root causes while enabling proactive implementation of preventive mitigation strategies.

2

Non-stop Water Installation

P11 can be installed with minimal access opening to minimize pipe damage while preserving structural integrity. The installation can be proceed without water service interruption. And **no on-site welding** is required thereby reducing operational hazards and streamlining deployment procedures.

The non-stop-water installation is **compatible with multiple pipe materials** including carbon steel, ductile iron, PE, concrete, and FRP. P11 has been successfully installed on all these types of material. We provide tailored installation solutions that accommodate both varying pipe materials and diameter specifications.



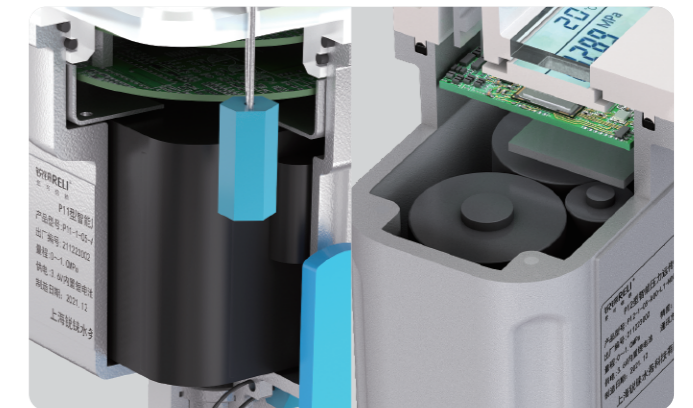
3

Integrated Lithium Battery

P11 features an integrated lithium battery that supports standalone power supply, allowing it to operate independently without relying on external power sources. This built-in battery is designed with durability in mind, offering a service life **exceeding 6 years** (measuring every 1s and upload every 1h).

For environments lacking accessible power infrastructure, this integrated battery enables seamless installation in remote or off-grid locations. Additionally, it serves as a reliable **backup power source**, ensuring continuous operation even when external power supply is interrupted.

Notably, when operating solely on battery power, the system maintains a stable measurement frequency of 1Hz, balancing energy efficiency with consistent performance.



Specification

Measurement Medium

Tap water

Application

Water pressure monitoring for water supply network
Water hammer detection for water supply network

Materials

Sensor

Stainless steel 304

Valve

Stainless steel 304

Housing

Stainless steel 304

Pipe Clamp

Stainless steel 304

Saddle Tee

Carbon steel

Temperature Range

Water Temperature Range

0°C to 60°C (32°F to 140°F)

(avoid freezing of the medium at the sensor diaphragm)

Storage Temperature Range

-40°C to 60°C (-40°F to 140°F)

Power Supply

Types

3.6V integrated lithium battery only
(supports measuring interval 1s only)

3.6V integrated lithium battery + DC 24V

Battery Life @ 0°C to 50°C (32°F to 132°F)

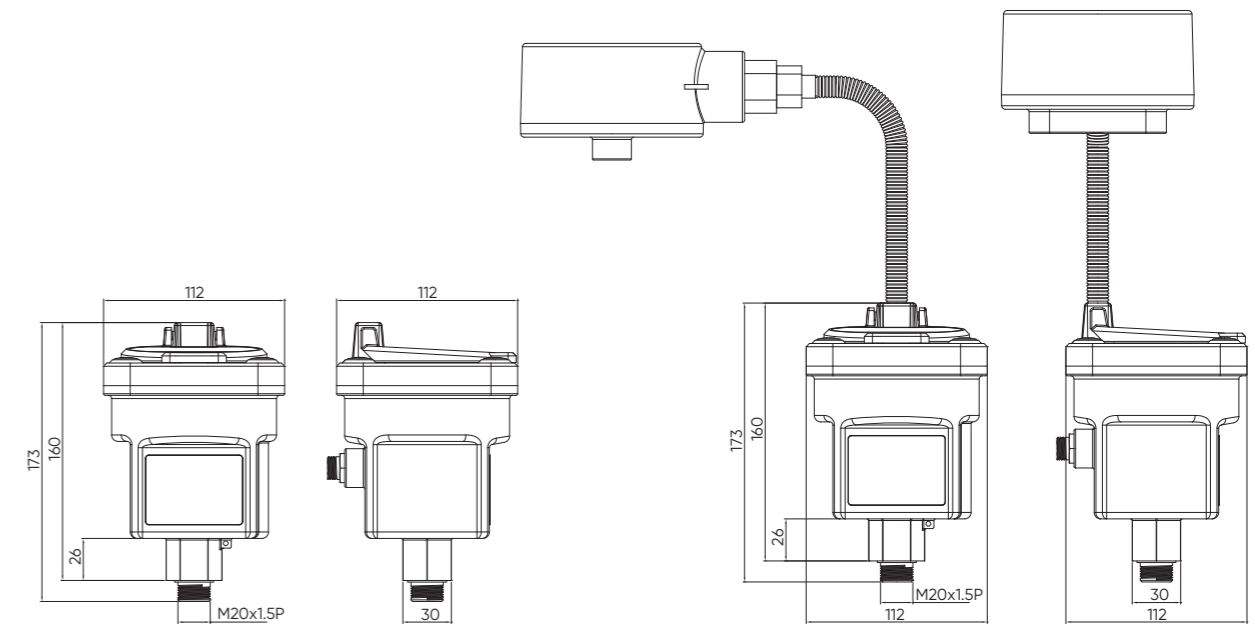
Typically 6 years (measuring every 1 second & remote transmitting every 1 hour, low temperature or low signal will cause lower battery life)

Alert Types

Water pressure reaches upper limit or lower limit

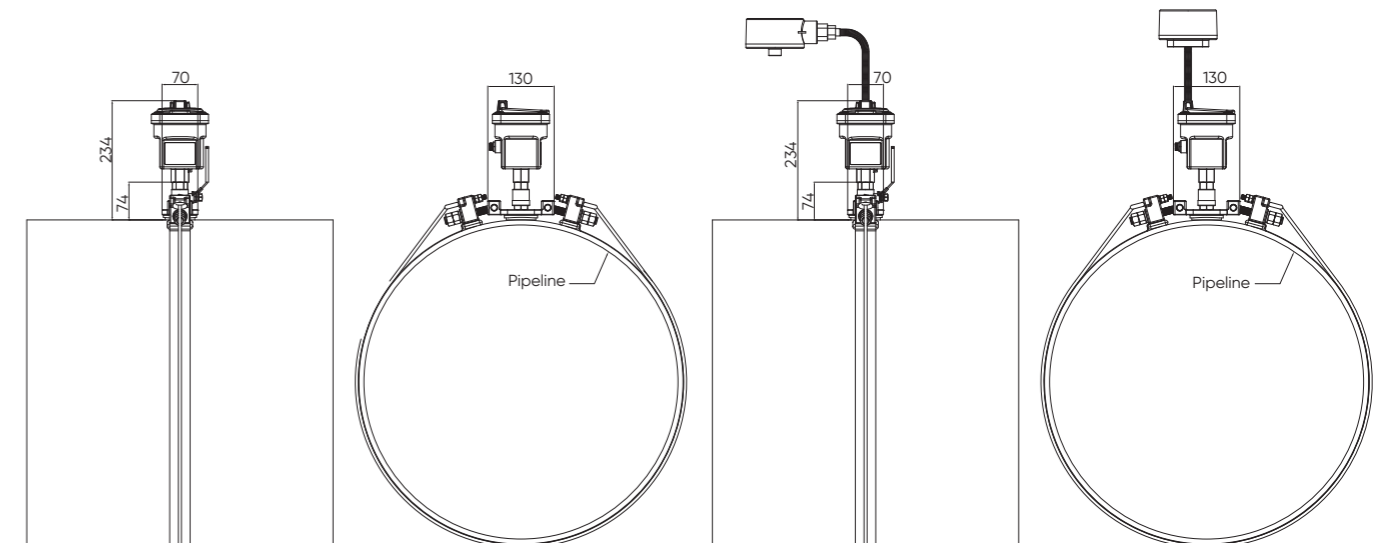
Dimensions

Compact Meter



Threaded Mount Type
(Integrated Antenna)

Threaded Mount Type
(External Antenna)

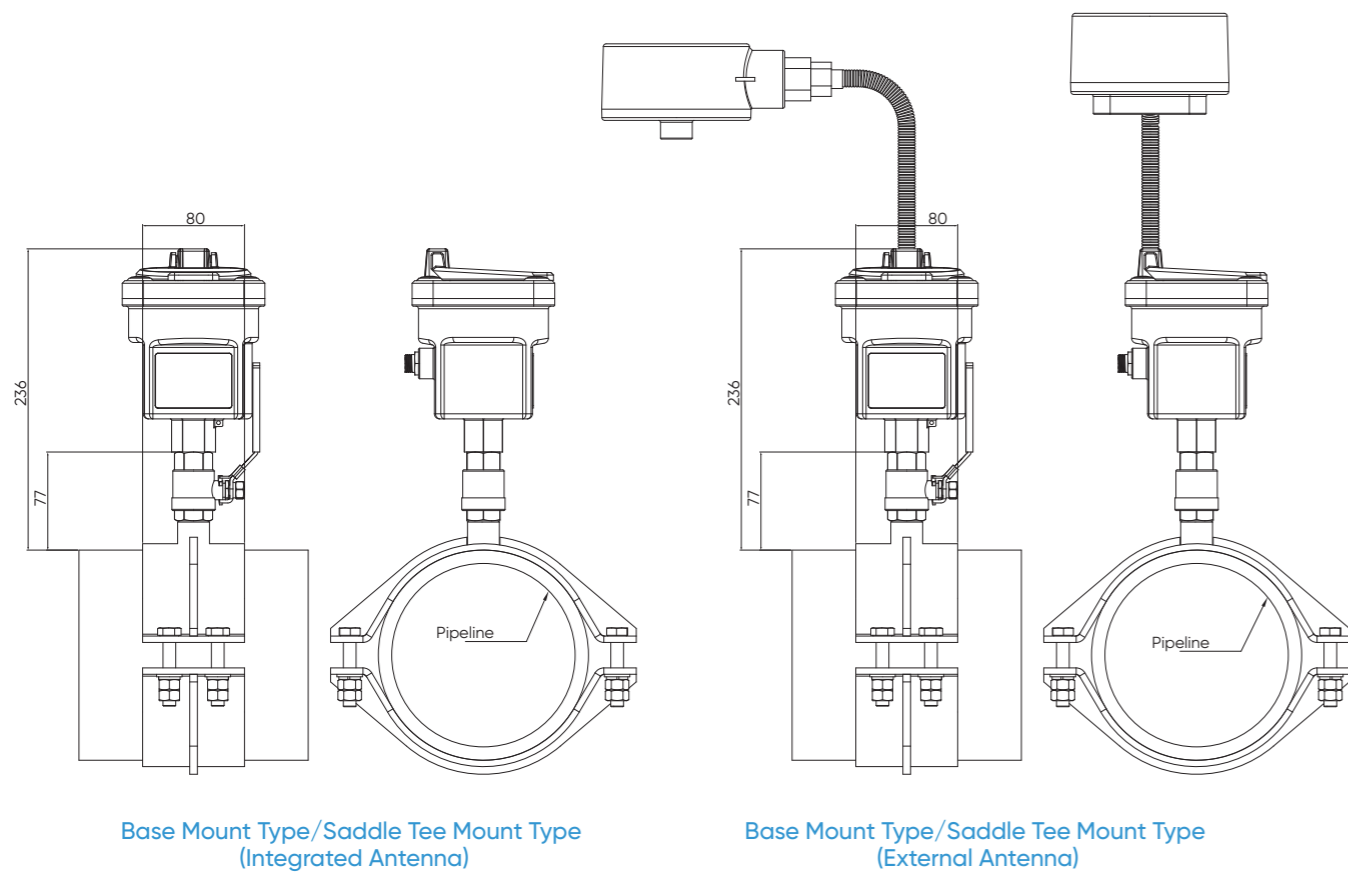


Base Mount Type/Saddle Tee Mount Type
(Integrated Antenna)

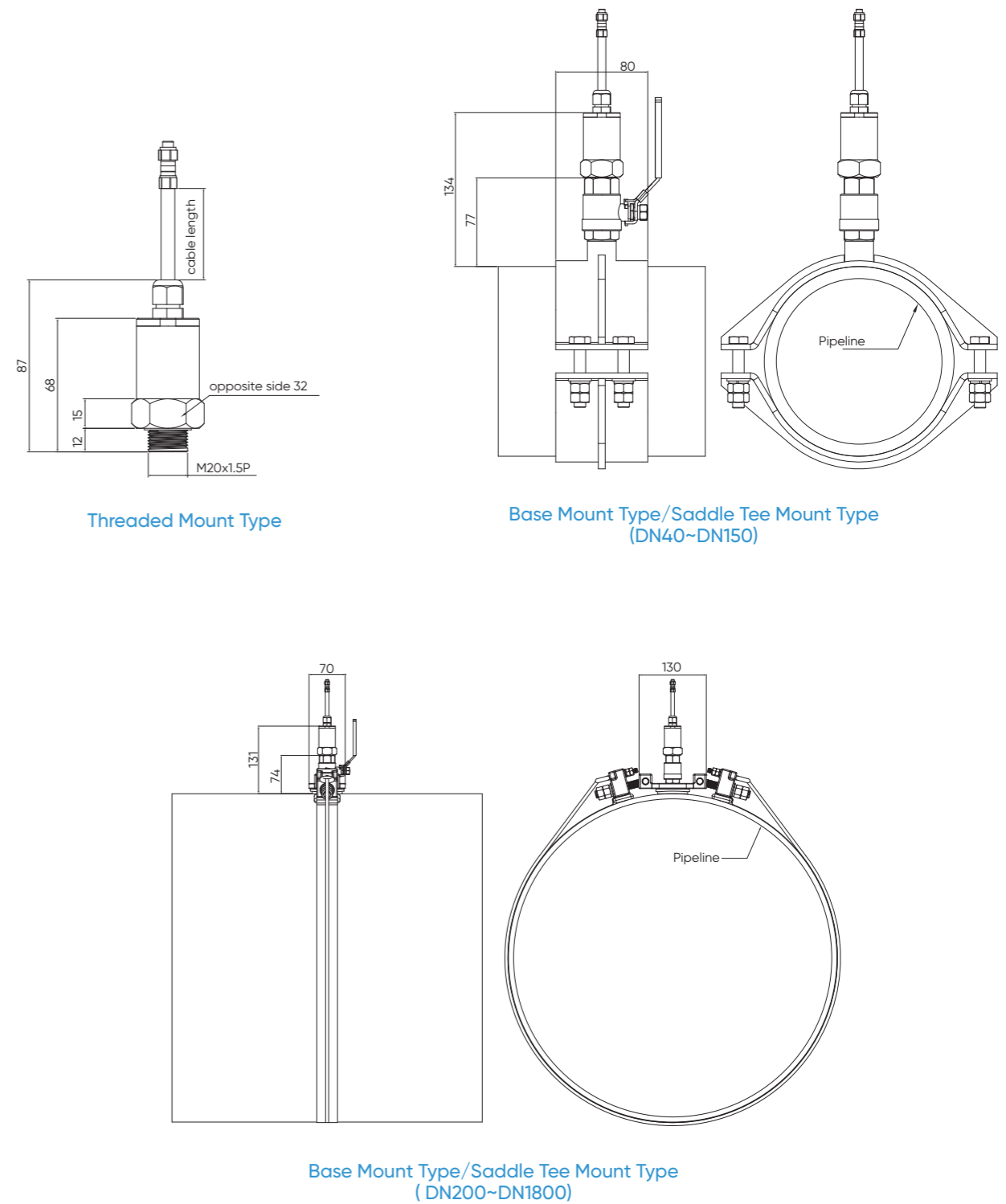
Base Mount Type/Saddle Tee Mount Type
(External Antenna)

Dimensions

Compact Meter

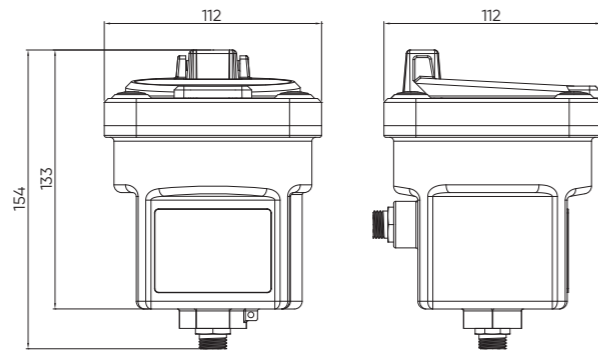


Sensor of Remote Version

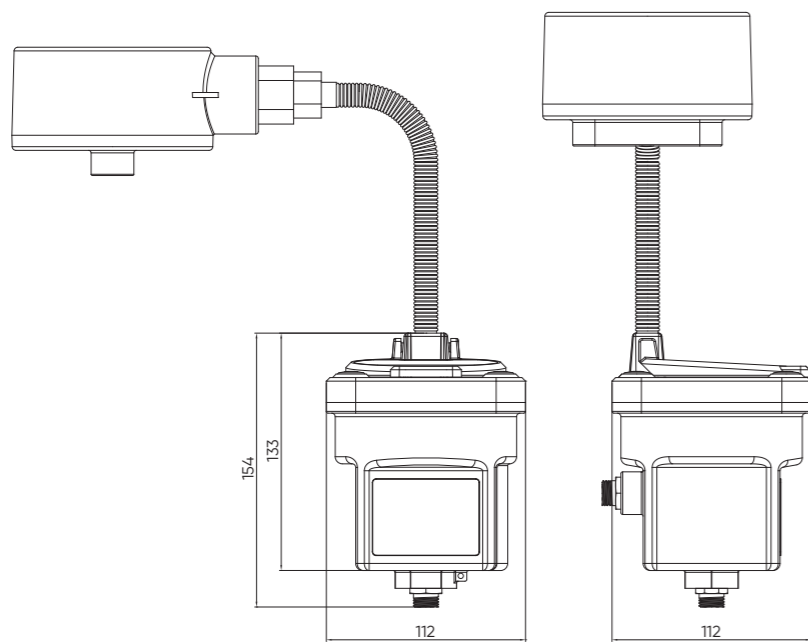


Dimensions

Transmitter of Remote Version



Integrated Antenna Type



External Antenna Type

Order Information

P11 |XX|X|XXX|LX|XXX|XX|XXX|SX|X|XX

Measurement Range

- 0 MPa - 2.0 MPa 20
- 0 MPa - 4.0 MPa (optional) 40

Measurement Accuracy

- ±0.5 % FS 5
- ±0.3 % FS (optional) 3

Transmitter Type Installation

- Integral with sensor A00
- Remote with 3 meters cable F03
- Remote with XX meters cable, up to 100 meters FXX

Power Supply

- 3.6V integrated lithium battery only L1
- 3.6V integrated lithium battery + DC 24V L3

RS-485

- No RS-485 communication N00
- No RS-485 communication, with XX meters power supply wire NXX
(for compact meter, default 5 meters wire; for remote version, default 1 meter wire)
- RS-485 (ModBus protocol), with XX meters RS-485 wire MXX
(for compact meter, default 5 meters wire; for remote version, default 1 meter wire)
- RS-485 (customized protocol), with XX meters RS-485 wire CXX
(For compact meter, default 5 meters wire; for remote version, default 1 meter wire)

Order Information

P11 |XX|X|XXX|LX|XXX|XX|XXX|SX|X|XX

Wireless Communication Type

- No wireless communication
- 4G

NO
G4

Antenna Type

- No antenna
- Integrated antenna
- External round antenna with 3 meters cable
- External round antenna with XX meters cable

N00
A00
Y03
YXX

Sim Card

- No SIM card
- User provided integrated SIM card
- User provided plug-in SIM card

S0
S2
S3

Communication Protocol

- Standard Reli protocol
- User customized protocol

S
C

P11 |XX|X|XXX|LX|XXX|XX|XXX|SX|X|XX

Installation Method

- Screw ended 10
- Base mount installation set/Saddle tee mount installation set for pipe with 200≤DN≤600 (including valve, mounting base, pipe clamp) 21
- Base mount installation set/Saddle tee mount installation set for pipe with 600<DN≤1000 (including valve, mounting base, pipe clamp) 22
- Base mount installation set/Saddle tee mount installation set for pipe with 1000<DN≤1800 (including valve, mounting base, pipe clamp) 23
- Base mount installation set/Saddle tee mount installation set for pipe with DN40 (including saddle tee, adapter, valve) (Requires precise outside diameter of the pipe) 31
- Base mount installation set/Saddle tee mount installation set for pipe with DN50 (including saddle tee, adapter, valve) (Requires precise outside diameter of the pipe) 32
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RELI[®] Story

Shanghai Reli Water Technology Co., Ltd. was founded in October 2018 by a team of industry veterans with extensive technical expertise, specializing in the R&D and manufacturing of intelligent hardware products for the water supply industry. We have obtained over 60 patents, 16 software copyrights, and 14 metrological instrument type approvals. Recognized as a High-Tech Enterprise in Shanghai, while we have also obtained various certifications including ISO9001:2015 (Quality Management System), ISO14001:2015 (Environmental Management System), ISO45001:2018 (Occupational Health & Safety Management System), and ISO/IEC27001:2022 (Information Security Management System). Our flow laboratory is accredited by ILAC-MRA/CNAS. Our electromagnetic water meter product is undergoing MID certification (expected to be completed by the end of 2025). Currently, we have served over 1,000 water utility clients nationwide.

Our manufacturing excellence is built upon four core competencies that drive industry innovation:

• R&D Capability

A self-driven innovation system enables rapid response to customized client requirements.

• Product Excellence

Years of technological accumulation have resulted in superior performance compared to competitors, featuring higher measurement stability, lower power consumption, cost efficiency, and unique functionalities—particularly evident in our electromagnetic water meters.

• Production Efficiency

Proprietary flexible production lines and single-piece flow manufacturing ensure high efficiency and consistent product quality.

• Quality Assurance

Self-developed flow testing equipment, certified by ILAC-MRA/CNAS, guarantees stable, efficient, and energy-saving testing processes.

Despite our established strengths, we keep investing heavily in R&D for continuous technological advancement. By delivering competitive products, professional services, and a commitment to integrity, Shanghai Reli aims to collaborate with strategic partners in market expansion or OEM initiatives, ultimately achieving mutual growth through customer satisfaction and long-term partnerships.

Factory buildings



RELI Vision

- Become an enterprise that is respected, liked, reliant, and focuses on the long-term value of users.
- Become the preferred brand committed to offering comprehensive solutions for users in the water supply industry.
- Become a model in the industry and assist peers to jointly provide superior products and services for users in the water supply industry.

RELI Mission

- Make every drop of water in the world smarter, more economical, more efficient, and more secure.

RELI Values

- By creating value for users, we can also create value for our own.
- The process of creating value is also a process of continuous growth.
- Growth requires constantly leaving one's comfort zone, which is very painful. Once we grow, the happiness brought by this sense of pride and sense of achievement brings us the power for better growth.

Flexible production line



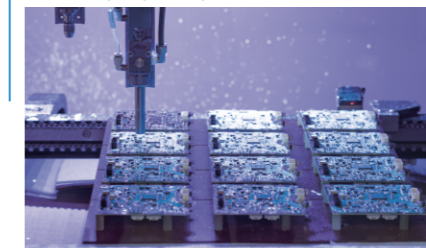
Calibration device (with ILAC-MRA/CNAS certificate)



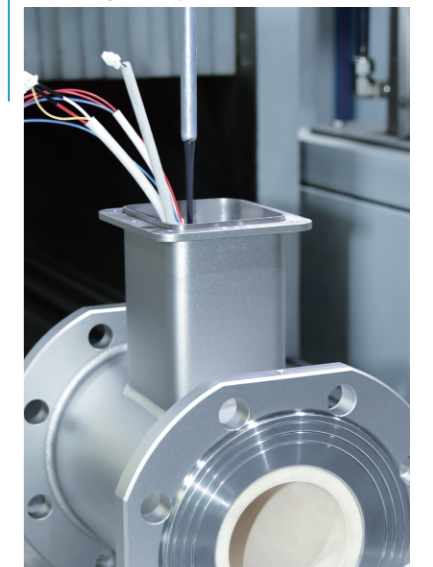
Laser marking



PCB triple proof paint



Resin injection process



Automatic winding machine

